$\mathbf{E}^{\mathbf{x}}$ ponent $^{\circ}$

Operable Unit 1
Phase IA Supplemental
Field Investigation
Data Report for the
Ventron/Velsicol Site
Wood-Ridge/Carlstadt,
New Jersey

Prepared for

Rohm and Haas Company Mt. Prospect, Illinois

E^xponent

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New Jersey

Prepared for

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Acronyms and Abbreviations

bgs below ground surface
DAF dilution attenuation factor

EPA U.S. Environmental Protection Agency
GWQS New Jersey Groundwater Quality Standards

IGWSCC New Jersey Impact to Groundwater Soil Cleanup Criteria

J estimated

MCL EPA Maximum Contaminant Level

MDL method detection limit

NRDCSCC New Jersey Non-Residential Direct Contact Soil Cleanup Criteria

NJDEP New Jersey Department of Environmental Protection

OU Operable Unit

Phase IA SFI Phase IA supplemental field investigation
Phase IA work plan Phase IA work plan dated September 9, 1999

QA/QC quality assurance and quality control

RDCSCC New Jersey Residential Direct Contact Soil Cleanup Criteria

RI remedial investigation
RPD relative percent difference
Site Ventron/Velsicol Site

SSL EPA soil screening level for migration to groundwater

SWQS New Jersey Surface Water Quality Standards

U undetected at detection limit shown

Introduction

This data report presents the results of a Phase IA supplemental field investigation (Phase IA SFI) completed as part of the Phase IA remedial investigation (RI) for the Ventron/Velsicol Site (Site) located in Wood-Ridge and Carlstadt, New Jersey. Field investigation activities were conducted at the Site in general accordance with the Work Plan for Supplemental Groundwater Sampling and Soil Assessment, dated May 30, 2002 (Exponent 2002). The scope of work addressed comments made by the New Jersey Department of Environmental Protection (NJDEP) in a letter dated April 18, 2002 (Zervas 2002a, pers. comm.). This work plan was approved with several changes as requested by NJDEP in a letter dated August 28, 2002 (Zervas 2002b, pers. comm.). NJDEP requested further evaluation of the occurrence of mercury in groundwater and soil at the site as follows:

- Sampling of all groundwater monitoring wells using previously approved techniques (Comment 1)
- Additional assessment of the potential presence of elemental mercury in the area of the former mercury processing facility (the area of the existing Wolf and U.S. Life Warehouse buildings) (Comment 2)
- Further delineation of mercury in soil north of the former mercury processing facility (Comment 3).

NJDEP approved analysis of additional metals in the monitoring well groundwater samples as well as soil sampling procedures for the offsite boreholes (Zervas 2002c, pers. comm.). Included with this report are tables and figures summarizing the analytical results of the field investigations, as well as laboratory analytical data reports (Appendix A), borehole logs (Appendix B), and a quality assurance review of the reported data (Appendix C). After approval of this report by NJDEP, the tables and illustrations will be incorporated into a revised version of the *Operable Unit 1 Remedial Investigation Report* for the Site, dated September 2000 (Exponent 2000).

Field Activities

Except where explicitly identified, the field procedures and analytical methods specified in the agency review draft *Phase IA Work Plan*, dated September 9, 1999 (Phase IA work plan [Exponent 1999]), or previous documents referenced therein, were adhered to during the Phase IA SFI.

Groundwater Sampling

The objective of the Phase IA SFI groundwater sampling was to provide an additional set of metals data for groundwater. Groundwater samples were collected from the 15 Site monitoring wells (MW-1 through MW-15) during September 24 to 27, 2002 (Figure 1).

Groundwater surface elevations were measured to the nearest 0.01 ft in each monitoring well before purging and sampling (Table 1). The groundwater samples were generally collected using the same procedures previously employed for groundwater collection at the Site. One modification was the use of a peristaltic pump (as specified in the May 30, 2002 supplemental work plan [Exponent 2002]) because volatilization of the groundwater samples was not a concern since the samples were analyzed for selected metals only. Samples planned for mercury analysis were collected using the "clean hands" technique to minimize potential crosscontamination. Filtered (dissolved) and unfiltered samples were collected from each of the monitoring wells. The samples were filtered in the field using a disposable, 0.45 μ m pore-size in-line filter.

Filtered (dissolved) and unfiltered samples were submitted to Cebam Analytical in Seattle, Washington, for low-level, total mercury analysis by U.S. Environmental Protection Agency (EPA) Method 1631. Unfiltered samples were submitted to Columbia Analytical Services in Rochester, New York, for analysis of total barium, copper, iron, lead, manganese, nickel, and vanadium by EPA Method 6010B. Unfiltered samples were also submitted to Severn Trent Services in Amherst, New York, for analysis of total arsenic, cadmium, and thallium by EPA Method 6020.

For quality assurance/quality control (QA/QC) purposes, one duplicate groundwater sample (filtered and unfiltered) was collected from monitoring well MW-7, and one equipment rinsate sample (filtered and unfiltered) was also collected. These samples were analyzed for the same constituents and by the same methods described above.

Copies of the analytical data reports are provided in Appendix A. The groundwater analytical results are summarized in Tables 2, 3, and 4 (with groundwater quality and surface water quality criteria comparisons).

Soil Sampling

The objectives of the soil assessment were to evaluate the potential presence of elemental mercury in shallow and subsurface soil adjacent to the warehouse buildings in the developed area of Operable Unit 1 (OU1), and to further delineate the offsite extent of mercury in soil to the north of this area (Figure 2). Eight onsite boreholes (B-1 through B-8) were drilled and sampled on October 8 and 9, 2002. Six offsite boreholes (B-9 through B-14) were drilled and sampled on October 9 and 10, 2002, and November 13, 2002 (Figure 3).

The boreholes were drilled by Summit Drilling of Bound Brook, New Jersey, using a hydraulic, direct-push drill rig. A geologist from Exponent provided oversight during drilling and logged the boreholes. All boreholes were drilled and sampled continuously through fill and native sandy soils until the top of the fine-grained unit was encountered (undifferentiated fine-grained deposits or varved silt and clay as described by Joseph S. Ward, Inc. [1974, 1975]). Soil sampling was facilitated using a 4-ft-long, stainless-steel core barrel sampler lined with a new, disposable, acetate liner for each sample collected. The boreholes were backfilled with bentonite grout and capped with asphalt patch or native soil material, as appropriate.

Soil samples collected from the boreholes were examined for lithology and the potential presence of elemental mercury. Logs of the boreholes are provided in Appendix B. The presence of elemental mercury was assessed in the field for each 2-ft sample interval by observations and hand lens examination, and by field screening using a portable Jerome[®] mercury vapor meter. The field screening results are provided on the borehole logs.

For onsite boreholes B-1 through B-8, soil samples were planned for laboratory analysis only if field mercury vapor concentrations exceeded 0.5 mg/m³. Soil with mercury vapor concentrations in excess of 0.5 mg/m³ was detected only in borehole B-5 from 6–10 ft below ground surface (bgs); consequently, soil samples SP0001 (6–7 ft bgs), SP0002 (7–8 ft bgs), SP0003 (8–9 ft bgs), and SP0004 (9–10 ft bgs) collected from borehole B-5 were submitted for laboratory analysis.

For offsite boreholes B-9 through B-14, soil samples were collected at 2-ft intervals. The three samples collected from 0-6 ft bgs (i.e., 0-2, 2-4, and 4-6 ft intervals) were pre-selected for laboratory analysis (although some intervals were not sampled due to insufficient sample recovery). Soil samples collected below 6 ft bgs from the offsite boreholes were archived for future analysis if the total mercury concentration in the 4-6 ft sample interval exceeded 14 mg/kg, the NJDEP Residential Direct Contact Soil Cleanup Criteria (RDCSCC) for offsite soil. The next deeper sample interval was analyzed from each borehole, if needed, until the total mercury concentration was below 14 mg/kg.

For QA/QC purposes, one duplicate soil sample was collected from the 0–2 ft sample interval from borehole B-10, and one equipment rinsate sample was also collected. All selected soil samples and the duplicate sample were analyzed for total mercury by EPA Method 7471A, and the equipment rinsate sample was analyzed for total mercury by EPA Method 7470A. Copies of the analytical data reports are provided in Appendix A. The soil analytical results are summarized in Tables 5, 6, and 7, with nonresidential direct contact (NRDCSCC), impact to groundwater (IGWSCC), and offsite RDCSCC comparisons, respectively.

One deviation from the work plan was the relocation of offsite boreholes B-10 through B-14. The boreholes were moved from their proposed locations to maintain a 25-ft offset from the railroad tracks as required by the Norfolk Southern Railroad. Relocation of the boreholes was approved by NJDEP (MacGregor 2002, pers. comm.).

Results of the Field Investigation

The results of a quality assurance review of the analytical data are provided in Appendix C. Analytical data were validated in accordance with applicable guidance specified by the *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (U.S. EPA 1994), the referenced method-specific quality control criteria, or in the context of the data quality objectives established for this project.

The results reported by the laboratories (Cebam Analytical, Columbia Analytical Services, and Severn Trent Services) are acceptable as reported and as qualified during the assessment of data quality. During the quality assurance review, 4 dissolved mercury results and 13 total arsenic results for groundwater were restated as undetected (U qualifier) due to rinsate blank contamination (the restated values were less than 5 times the concentration measured in the rinsate blank sample). Two dissolved groundwater mercury results and two soil mercury results were restated as estimated (J qualifier) due to low relative percent difference (RPD) between the sample and sample duplicate for both media. No results were rejected.

Groundwater Results

The monitoring well locations and historical mercury concentrations in groundwater are shown on Figure 1. Phase IA SFI groundwater surface elevations and contours are shown on Figure 3. A time series plot of historical groundwater elevations is shown on Figure 4. The Phase IA SFI groundwater analytical results are summarized in Tables 2 through 4. Table 2 presents comparison of the data to New Jersey groundwater quality standards (GWQS). Table 3 presents comparison of the data to EPA drinking water Maximum Contaminant Levels (MCLs) (as requested by NJDEP). Table 4 presents comparison of the data to New Jersey surface water quality standards (SWQS) for fresh water. Table 4 includes only the results from the Site perimeter wells. Historical groundwater levels and elevations are summarized in Table 1.

The groundwater analytical results indicated the following ranges of metals concentrations: arsenic (2.23 U to 41.5 μ g/L), barium (20 U to 1,100 μ g/L), cadmium (0.5 U to 0.841 μ g/L), copper (20 U μ g/L), iron (100 U to 31,700 μ g/L), lead (5 U μ g/L), manganese (10 U to 4,180 μ g/L), dissolved mercury (0.002 U to 12.55 μ g/L), total mercury (0.017 to 22.91 μ g/L), nickel (40 U μ g/L), thallium (0.2 U to 0.2973 μ g/L), and vanadium (50 U to 62.9 μ g/L).

Mercury concentrations that exceeded the GWQS (2 μ g/L for total and dissolved mercury) occurred in monitoring wells MW-7 (5.83 μ g/L total), MW-9 (3.86 μ g/L total), and MW-13 (12.55 μ g/L dissolved and 22.91 μ g/L total). Monitoring wells MW-7, MW-9, and MW-13 are located around the perimeter of the Wolf Warehouse in the developed area of the Site. Other metals concentrations that exceeded the available GWQS included arsenic in wells MW-6, MW-13, and MW-15, iron in all wells except MW-10, MW-12, and MW-14, and manganese in all wells except MW-9.

The MCL and GWQS values for mercury are equivalent; therefore, mercury concentrations that exceeded the MCL also exceeded the GWQS. The only other MCL exceeded was arsenic in wells MW-6 (12.2 μ g/L), MW-13 (41.5 μ g/L), and MW-15 (10.9 μ g/L) (MCL 10 μ g/L).

Mercury concentrations in the Site perimeter monitoring wells above the SWQS (0.144 μ g/L for total and dissolved mercury) occurred in monitoring wells MW-8 (0.192 μ g/L dissolved and 0.583 μ g/L total) and MW-15 (0.345 μ g/L total only). The only other SWQS exceeded was arsenic in wells MW-6 (12.2 μ g/L) and MW-15 (10.9 μ g/L). It should be noted that the restated undetected values for the other perimeter wells exceeded the arsenic SWQS. The SWQS for arsenic is 0.017 μ g/L.

Soil Results

The Phase IA SFI borehole locations and soil mercury concentrations are shown on Figure 3. The soil analytical results are summarized in Tables 5 through 7. Table 5 presents comparison of the data to NRDCSCC. Table 6 presents comparison of the data to RDCSCC for offsite boreholes only. Table 7 presents a comparison of the data to the U.S. EPA SSL for a dilution attenuation factor (DAF) of 1 (as requested by NJDEP).

Elemental mercury was not observed during the Phase IA SFI. Mercury vapor concentrations in soil exceeded 0.5 mg/m³ in only one borehole, borehole B-5 from 6–8 ft bgs (0.698 mg/m³) and 8–10 ft bgs (0.861 mg/m³). The borehole data indicated the fine-grained deposits were encountered at depths of approximately 10–32 ft bgs. The deposits were observed at greater depths in the general area between the two warehouse buildings, and were shallower toward the northwest and southeast sides of the buildings.

Total mercury was not detected at or above the laboratory method detection limit (MDL) in three samples (B-10 at 8-10 ft bgs, B-11 at 6-8 ft bgs, and B-13 at 2-4 ft bgs). Total mercury was detected in all other soil samples at concentrations varying from 0.04 mg/kg (B-14 at 6-8 ft bgs) to 750 mg/kg (B-5 at 6-7 ft bgs).

Only one soil mercury concentration (750 mg/kg in borehole B-5 at 6–7 ft bgs) exceeded the NRDCSCC of 270 mg/kg.

Several soil mercury concentrations in offsite boreholes B-9 through B-14 exceeded the RDCSCC of 14 mg/kg as follows: B-9 at 0–2 ft bgs (240 mg/kg), B-10 at 0–2 ft bgs (13.3 *J* and 31.7 *J* mg/kg), B-10 at 4–6 ft bgs (42.8 mg/kg), B-11 at 4–6 ft bgs (16.6 mg/kg), B-13 at 0–2 ft bgs (52.6 mg/kg), B-13 at 4–6 ft bgs (172 mg/kg), B-13 at 6–8 ft bgs (52.1 mg/kg), B-13 at 8–10 ft bgs (35.0 mg/kg), B-13 at 12-14 ft bgs (31.0 mg/kg), B-14 at 0–2 ft bgs (67.1 mg/kg), and B-14 at 4–6 ft bgs (162 mg/kg).

At all offsite borehole locations except one, mercury concentrations in the deepest interval analyzed were below the RDCSCC of 14 mg/kg. At borehole B-13, the deepest two intervals were analyzed simultaneously to meet the laboratory holding time deadline. While the second deepest interval (10–12 ft bgs) had a mercury concentration of 0.75 mg/kg (below the RDCSCC), the mercury concentration in the deepest interval (31.0 mg/kg at 12–14 ft bgs)

exceeded the RDCSCC. Deeper intervals were not analyzed because the holding time was exceeded.

Soil mercury concentrations in 20 of the 26 samples analyzed exceeded the SSL of 0.1 mg/kg in boreholes as follows: B-5 at 6–7 ft bgs (750 mg/kg), 7–8 ft bgs (128 mg/kg), 8–9 ft bgs (252 mg/kg), and 9–10 ft bgs (12.3 mg/kg); B-9 at 0–2 ft bgs (240 mg/kg) and 2–4 ft bgs (0.21 mg/kg); B-10 at 0–2 ft bgs (13.3 J and 31.7 J mg/kg) and 4–6 ft bgs (42.8 mg/kg); B-11 at 0–2 ft bgs (2.8 mg/kg) and 4–6 ft bgs (16.6 mg/kg); B-12 at 0–2 ft bgs (0.33 mg/kg); B-13 at 0–2 ft bgs (52.6 mg/kg), 4–6 ft bgs (172 mg/kg), 6–8 ft bgs (52.1 mg/kg), 8–10 ft bgs (35.0 mg/kg), 10–12 ft bgs (0.75 mg/kg), and 12–14 ft bgs (31.0 mg/kg); and B-14 at 0–2 ft bgs (67.1 mg/kg) and 4–6 ft bgs (162 mg/kg).

References

Exponent. 1999. Agency review draft, Phase IA work plan, Ventron/Velsicol Site, Wood-Ridge/Carlstadt, New Jersey. September 9, 1999. Exponent, Natick, MA.

Exponent. 2000. Operable Unit 1 remedial investigation report: Ventron/Velsicol Site, Wood-Ridge/Carlstadt, New Jersey. September 2000. Exponent, Natick, MA.

Exponent. 2002. Work plan for supplemental groundwater sampling and soil assessment, Phase I A remedial investigation, Ventron/Velsicol Site, Wood-Ridge/Carlstadt, New Jersey, Project No. 8600B3N.005 0401. May 30, 2002. Exponent, Lake Oswego, OR.

Joseph S. Ward, Inc. 1974. Report on soils investigation, Park Place East Development, Woodridge, New Jersey. May 1974. Joseph F. Ward, Inc., Caldwell, NJ.

Joseph S. Ward, Inc. 1975. Report of soils and foundation investigation, Woodridge Development, Woodridge/Carlstadt, New Jersey. 1975. Joseph F. Ward, Inc., Caldwell, NJ.

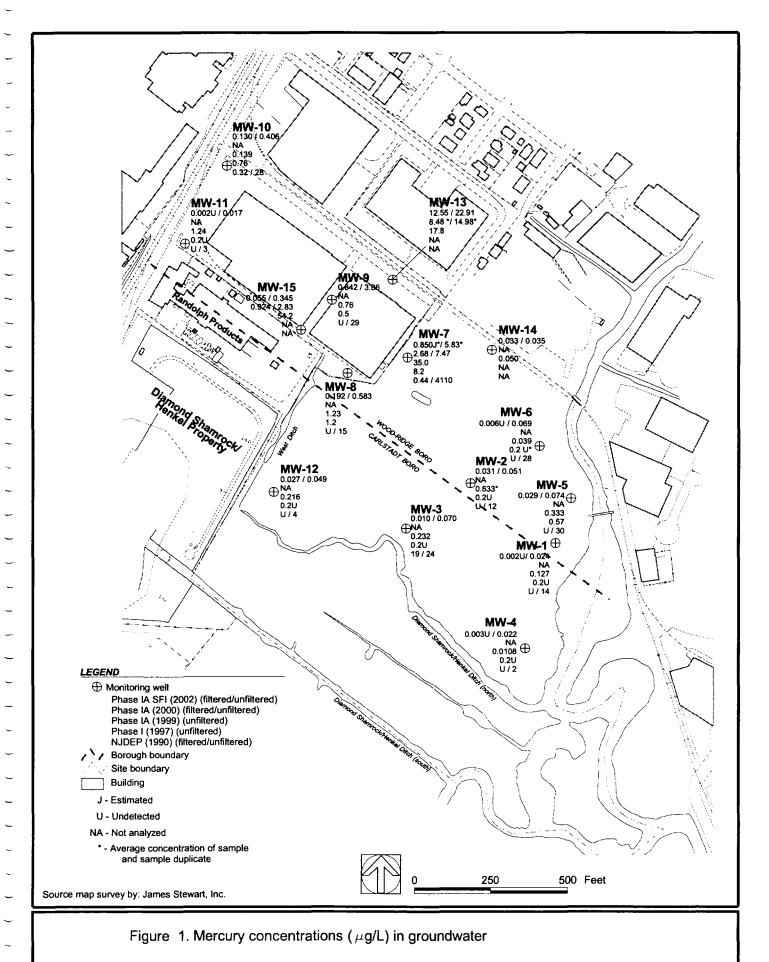
MacGregor, S. 2002. Personal communication (conversation with Ron Lantzy, Rohm and Haas Company, Bristol, PA, on October 10, 2002, regarding relocation of boreholes). New Jersey Department of Environmental Protection, Trenton, NJ.

US. EPA. 1994. Contract Laboratory Program national functional guidelines for inorganic data review. EPA 540/R-940/013. February 1994. Office of Solid Waste and Emergency Response. U.S. Environmental Protection Agency, Washington, D.C.

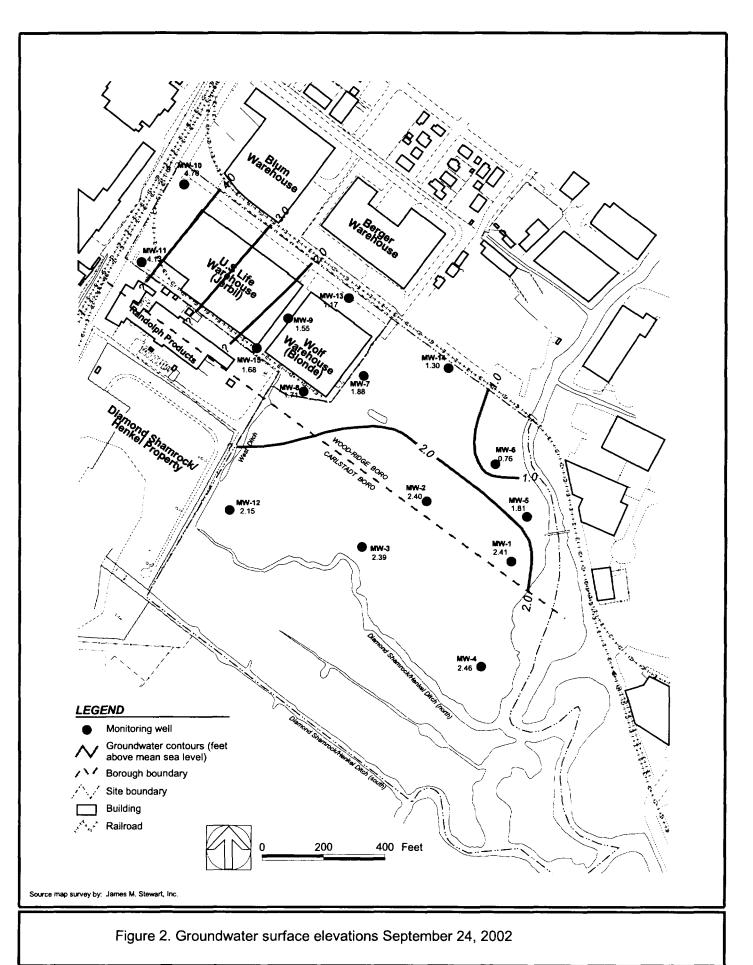
Zervas, G. 2002a. Personal communication (letter to J. Hock, CEC Inc., Downers Grove, IL, dated August 28, 2002, regarding Venton/Velsicol superfund site). New Jersey Department of Environmental Protection, Trenton, NJ.

Zervas, G. 2002b. Personal communication (letter to J. Hock, CEC Inc., Downers Grove, IL, dated April 18, 2002, regarding Venton/Velsicol superfund site). New Jersey Department of Environmental Protection, Trenton, NJ.

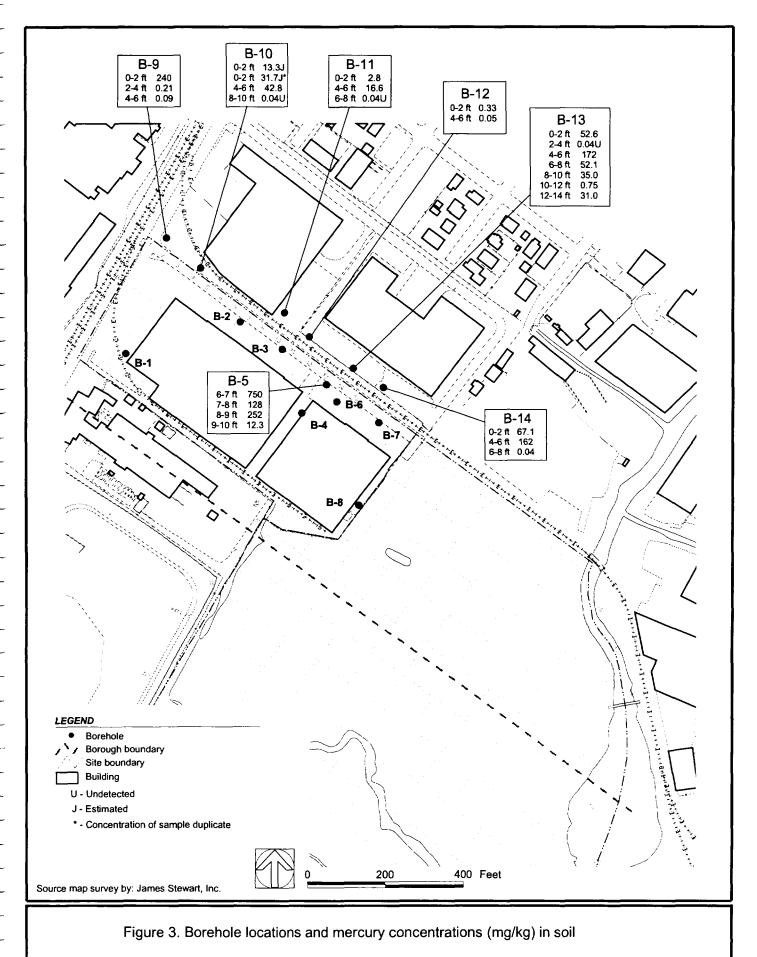
Zervas, G. 2002c. Personal communication (e-mail to K. Walanski, Rohm & Haas Company, Mt. Prospect, IL, dated September 11, 2002, regarding groundwater analytical testing program for the Phase IA SFI. New Jersey Department of Environmental Protection, Trenton, NJ.



8600B3N.005.0404 12/6/02 OR / Mercury conc. liquid /graphics/ventron_velsicol/woodridge_2.apr



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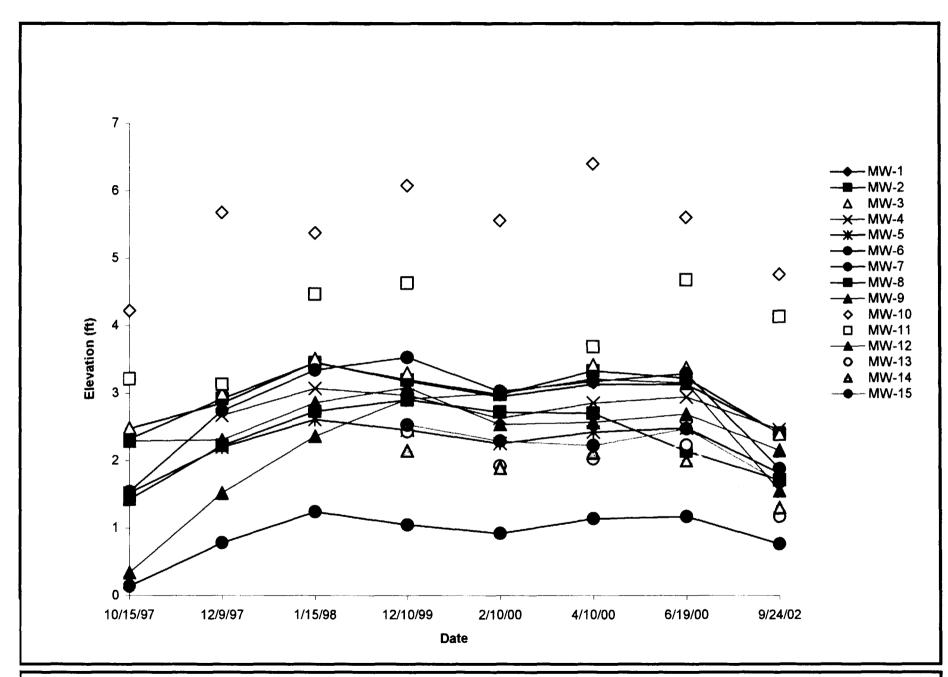


Figure 4. Groundwater surface elevation measurements, time series for each well

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Table 1. Summary of groundwater elevation measurements

			October 1	5, 1997	December	9, 1997	Januar	y 15, 1998
Monitoring	Ground	Elevation of	Depth to	Groundwater	Depth to	Groundwater	Depth to	Groundwater
Well	Elevation	Measuring Point	Water	Elevation	Water	Elevation	Water	Elevation
MW-1	8.68	11.36	8.89	2.47	8.51	2.85	7.90	3.46
MW-1A	NA	9.15	6.53	2.62	6.44	2.71	NA	NA
MW-2	10.30	12.94	10.62	2.32	10.02	2.92	9.49	3.45
MW-3	9.55	12.32	9.84	2.48	9.32	3.00	8.81	3.51
MW-4	7.90	9.89	NA	NA	7.22	2.67	6.82	3.07
MW-4A	NA	11.55	8.72	2.83	9.09	2.46	NA	NA
MW-5	8.86	10.70	9.18	1.52	8.50	2.20	8.09	2.61
MW-6	9.57	12.12	11.98	0.14	11.34	0.78	10.88	1.24
MW-7	5.35	7.19	5.65	1.54	4.45	2.74	3.85	3.34
MW-8	5.36	8.10	6.68	1.42	5.88	2.22	5.37	2.73
MW-9	4.02	6.60	6.26	0.34	5.08	1.52	4.24	2.36
MW-10	6.76	6.52	2.30	4.22	0.84	5.68	1.14	5.38
MW-11	5.06	4.83	1.62	3.21	1.70	3.13	0.36	4.47
MW-12	5.80	7.73	5.44	2.29	5.42	2.31	4.87	2.86
MW-12A		7.56	5.51	2.05	7.18	.38	NA	NA
MW-14								
MW-15								
Upstream ^a		9.13	NA	NA	10.60	- 1.47	10.77	- 1.64
Downstream ^b		9.13	NA	NA	7.58	1.55	7.56	1.57

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Table 1. (cont.)

			Decembe	er 10, 1999	Februar	/ 10, 2000	April 1	10, 2000
Monitoring	Ground	Elevation of	Depth to	Groundwater	Depth to	Groundwater	Depth to	Groundwater
Well	Elevation	Measuring Point	Water ^c	Elevation	Water	Elevation	Water	Elevation
MW-1	8.68	11.36	8.18	3.18	8.41	2.95	8.23	3.13
MW-1A								
MVV-2	10.30	12.94	9.74	3.20	9.96	2.98	9.61	3.33
MW-3	9.55	12.32	9.02	3.30	9.29	3.03	8.90	3.42
MW-4	7.90	9.89	6.92	2.97	7.26	2.63	7.04	2.85
MW-4A								
MW-5	8.86	10.70	8.25	2.45	8.45	2.25	8.28	2.42
MW-6	9.57	12.12	11.07	1.05	11.20	0.92	10.98	1.14
MW-7	5.35	7.19	3.66	3.53	4.16	3.03	4.02	3.17
MW-8	5.36	8.10	5.20	2.90	5.38	2.72	5.40	2.70
MW-9	4.02	6.60	3.69	2.91	3.60	3.00	3.39	3.21
MW-10	6.76	6.52	0.44	6.08	0.96	5.56	0.12	6.40
MVV-11	5.06	4.83	0.20	4.63	NA	NA	1.14	3.69
MW-12	5.80	7.73	4.65	3.08	5.19	2.54	5.16	2.57
MW-12A	4.46	4.07	1.64	2.43	2.15	1.92	2.05	2.02
MW-14	5.64	7.45	5.30	2.15	5.56	1.89	5.33	2.12
MW-15	4.20	4.58	2.05	2.53	2.29	2.29	2.36	2.22
Upstream ^a								
Downstream ^b								

825840020

Table 1. (cont.)

			June 1	19, 2000	Septemb	er 24, 2002
Monitoring	Ground	Elevation of	Depth to	Groundwater	Depth to	Groundwater
Well	Elevation	Measuring Point	Water	Elevation	Water	Elevation
MW-1	8.68	11.36	8.23	3.13	8.95	2.41
MW-1A						
MW-2	10.30	12.94	9.72	3.22	10.54	2.40
MW-3	9.55	12.32	8.94	3.38	9.93	2.39
MW-4	7.90	9.89	6.95	2.94	7.43	2.46
MW-4A						
MW-5	8.86	10.70	8.22	2.48	8.89	1.81
MW-6	9.57	12.12	10.95	1.17	11.36	0.76
MW-7	5.35	7.19	3.90	3.29	5.31	1.88
MW-8	5.36	8.10	5.96	2.14	6.39	1.71
MW-9	4.02	6.60	3.45	3.15	5.05	1.55
MW-10	6.76	6.52	0.91	5.61	1.76	4.76
MW-11	5.06	4.83	0.15	4.68	0.70	4.13
MW-12	5.80	7.73	5.04	2.69	5.58	2.15
MW-12A	4.46	4.07	1.84	2.23	2.90	1.17
MW-14	5.64	7.45	5.45	2.00	6.15	1.30
MW-15	4.20	4.58	2.11	2.47	2.90	1.68
Upstream ^a						
Downstream ^b						

Notes:

All elevations in feet above mean sea level

Depth to water measurements in feet

MW-15 was converted to a flush mount type completion on 12/10/99

MW-11 was saturated with snow melt water on 2/10/00

NA - not accessible for measurement

^a Surface water measuring point upstream of tide gate on Berry's Creek.

^b Surface water measuring point downstream of tide gate on Berry's Creek.

^c Post-sampling measurements.

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Table 2. Phase IA SFI groundwater analytical results with GWQS comparisons

		-			Sam	ple Location and Da	ate of Sample Colle	ction		
		-	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-7 (dup)
		NJ	GW0302	GW0304	GW0306	GW0305	GW0303	GW0310	GW0311	GW0312
Analyte	Units	GWQS	9/24/2002	9/25/2002	9/25/2002	9/25/2002	9/25/2002	9/26/2002	9/26/2002	9/26/2002
fletals										
Arsenic	μ g/L	8	3.21 <i>U</i>	6.67 <i>U</i>	2.52 <i>U</i>	2.82 <i>U</i>	3.01 <i>U</i>	12.2	3.55 <i>U</i>	3.33 <i>U</i>
Barium	µg/L	2,000	493	1,100	150	592	670	194	363	372
Cadmium	μg/L	4	0.5 <i>U</i>	0.5 <i>U</i>	0.5 <i>U</i>	0.5 <i>U</i>	0.5 <i>U</i>	0.5 <i>U</i>	0.831	0.851
Copper	μg/L	1,000_	20 U	20 U	20 <i>U</i>	20 U	20 U	20 U	20 <i>U</i>	20 U
Iron	μg/L	300	18,100	17,300	15,800	19,400	20,700	17,300	27,100	27,600
Lead	$\mu\mathrm{g/L}$	10_	5 U	5 <i>U</i>	5 <i>U</i>	5_ <i>U</i>	5 U	5 U	5 <i>U</i>	5 U
Manganese	μ g/L	50	838	1,200	2,820	1,050	1,040	3,730	861	889
Mercury (dissolved, filtered)	μg/L	2	0.002 <i>U</i>	0.031	0.010	0. 003 <i>U</i>	0.029	0. 00 6 <i>U</i>	1.06 J	0.637 J
Mercury (total, unfiltered)	μ g/L	2	0.024	0.051	0.070	0.022	0.074	0.069	6.16	5.49
Nickel	μg/L	100	40 <i>U</i>	40 <i>U</i>	40 <i>U</i>	40 <i>U</i>	40 <i>U</i>	40 <i>U</i>	40 <i>U</i>	40 <i>U</i>
Thallium	μ g/L	10	0.2 <i>U</i>	0.2973	0.2 <i>U</i>	0.2 <i>U</i>	0.2 <i>U</i>	0.2 <i>U</i>	0.2 <i>U</i>	0.2 <i>U</i>
Vanadium	μ g/L		50 <i>U</i>	50 U	50 <i>U</i>	50 <i>U</i>	50 <i>U</i>	50 U	50 <i>U</i>	50 U

Table 2. (cont.)

					Sa	mple Location and D	ate of Sample Colle	ection		
	11.24.	NJ OWOS	MW-8 GW0313	MW-9 GW0316	MW-10 GW0315	MW-11 GW0301	MW-12 GW0307	MW-13 GW0314	MW-14 GW0309	MW-15 GW0317
Analyte Metals	Units	GWQS	9/26/2002	9/27/2002	9/27/2002	9/24/2002	9/25/2002	9/26/2002	9/26/2002	9/27/2002
Metals								<u> </u>		
Arsenic	μ g/L	8	4.89 <i>U</i>	2.83 <i>U</i>	2.9 <i>U</i>	2.23 <i>U</i>	3.25 <i>U</i>	41.5	4.42 U	10.9
Barium	μ g/L	2,000	395	20 <i>U</i>	471	315	90.3	338	300	75.4
Cadmium	μ g/L	4	0.5 <i>U</i>	0.5 <i>U</i>	0.5 <i>U</i>	0.5 <i>U</i>	0.5 <i>U</i>	0.5 <i>U</i>	0.5 <i>U</i>	0.5 <i>U</i>
Copper	μ g/L	1,000_	20 U	20_U	20 <i>U</i>	20 U	20 <i>U</i>		20 <i>U</i>	20 U
Iron	μg/L	300	31,700	387	122	7,630	100	2,350	100 <i>U</i>	5,110
Lead	μ g/L	10_	5 U	5 <i>U</i>	5 U	5 U	5 U	5 U	5 <i>U</i>	5 <i>U</i>
Manganese	μg/L	50	4,180	10 <i>U</i>	366	681	182	1,380	3,690	1,500
Mercury (dissolved, filtered)	μ g/L	2	0.192	0.842	0.130	0.002 <i>U</i>	0.027	12.55	0.033	0.055
Mercury (total, unfiltered)	μ g/L	2	0.583	3.86	0.406	0.017	0.049	22.91	0.035	0.345
Nickel	μg/L	100	40 <i>U</i>	40 <i>U</i>	40 <i>U</i>	4 0 <i>U</i>	40 <i>U</i>	40 <i>U</i>	40 <i>U</i>	40 <i>U</i>
Thallium	μ g/L	10	0.2 <i>U</i>	0.2 <i>U</i>	0.2 <i>U</i>	0.2 <i>U</i>	0.2 <i>U</i>	0.2 <i>U</i>	0.2 <i>U</i>	0.2 <i>U</i>
Vanadium	μg/L		50 <i>U</i>	50 <i>U</i>	50 <i>U</i>	62.9	50 U	50 U	50 <i>U</i>	50 <i>U</i>

Note: -- - no criterion for this analyte

U - indicates that the compound was analyzed for but πot detected

J - indicates an estimated concentration

dup - duplicate sample

GWQS - Groundwater Quality Standards (NJAC 7:9-6; January 1993)

SFI - supplemental field investigation

Boxed entries indicate measurements at or above the criteria value.

82584002

Table 3. Phase IA SFI groundwater analytical results with MCL comparisons

					Sam	ple Location and	Date of Sample	Collection		
			MW-1 GW0302	MW-2 GW0304	MW-3 GW0306	MW-4 GW0305	MW-5 GW0303	MW-6 GW0310	MW-7 GW0311	MW-7 (dup) GW0312
Analyte	Units	MCL	9/24/2002	9/25/2002	9/25/2002	9/25/2002	9/25/2002	9/26/2002	9/26/2002	9/26/2002
etals										
Arsenic	μ g/L	10	3.21 <i>U</i>	6.67 <i>U</i>	2.52 <i>U</i>	2.82 <i>U</i>	3.01 <i>U</i>	12.2	3.55 <i>U</i>	3.33 <i>U</i>
Barium	μ g/L	2,000	493	1,100	150	592	670	194	363	372
Cadmium	μg/L	5	0.5 <i>U</i>	0.5 <i>U</i>	0.5 <i>U</i>	0.5 <i>U</i>	0.5 <i>U</i>	0.5 <i>U</i>	0.831	0.851
Copper	μ g/L	1,300	20 U	20 <i>U</i>	20 <i>U</i>	20 <i>U</i>	20 <i>U</i>	20 <i>U</i>	20 <i>U</i>	20 <i>U</i>
Iron	μ g/L		18,100	17,300	15,800	19,400	20,700	17,300	27,100	27,600
Lead	μg/L	15	5 U	5 U	5 <i>U</i>	5 <i>U</i>	5 U	5 U	5 <i>U</i>	5 U
Manganese	μ g/L		838	1,200	2,820	1,050	1,040	3,730	861	889
Mercury (dissolved, filtered)	μ g/L	2	0.002 <i>U</i>	0.031	0.010	0.003 <i>U</i>	0.029	0.006 <i>U</i>	1.06 J	0.637 J
Mercury (total, unfiltered)	μ g/L	2	0.024	0.051	0.070	0.022	0.074	0.069	6.16	5.49
Nickel	μ g/L		40 <i>U</i>	40 <i>U</i>	40 <i>U</i>	40 <i>U</i>	40 <i>U</i>	4 0 <i>U</i>	40 <i>U</i>	40 <i>U</i>
Thallium	μ g/L	2	0.2 <i>U</i>	0.2973	0.2 <i>U</i>	0.2 <i>U</i>	0.2 <i>U</i>	0.2 <i>U</i>	0.2 <i>U</i>	0.2 <i>U</i>
Vanadium	μg/L		50 <i>U</i>	50 <i>U</i>	50 <i>U</i>	50 <i>U</i>	50 <i>U</i>	50 U	50 <i>U</i>	50 U

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Table 3. (cont.)

					Sam	ole Location and	Date of Sample C	Collection		
			MW-8	MW-9	MW-10	MW-11	MW-12	MW-13	MW-14	MW-15
			GW0313	GW0316	GW0315	GW0301	GW0307	GW0314	GW0309	GW0317
Analyte	Units	MCL _	9/26/2002	9/27/2002	9/27/2002	9/24/2002	9/25/2002	9/26/2002	9/26/2002	9/27/2002
Metals										
Arsenic	μg/L	10	4.89 <i>U</i>	2.83 <i>U</i>	2.9 <i>U</i>	2.23 <i>U</i>	3.25 <i>U</i>	41.5	4.42 <i>U</i>	10.9
Barium	μg/L	2,000	395	20 <i>U</i>	471	315	90.3	338	300	75.4
Cadmium	μ g/L	5	0.5 <i>U</i>	0.5 <i>U</i>	0.5 <i>U</i>	0.5 <i>U</i>	0.5 <i>U</i>	0.5 <i>U</i>	0.5 <i>U</i>	0.5 <i>U</i>
Copper	μg/L	1,300	20 U	20 <i>U</i>	20 <i>U</i>	20 <i>U</i>	20 <i>U</i>	20 <i>U</i>	20 <i>U</i>	20 <i>U</i>
Iron	μg/L		31,700	387	122	7,630	100	2,350	100 <i>U</i>	5,110
Lead	μg/L	15	5 U	5 U	5 <i>U</i>	5 <i>U</i>	5 <i>U</i>	5 <i>U</i>	5 <i>U</i>	5 <i>U</i>
Manganese	μ g/L		4,180	10 <i>U</i>	366	681	182	1,380	3,690	1,500
Mercury (dissolved, filtered)	μ g/L	2	0.192	0.842	0.130	0.002 <i>U</i>	0.027	12.55	0.033	0.055
Mercury (total, unfiltered)	μ g/L	2	0.583	3.86	0.406	0.017	0.049	22.91	0.035	0.345
Nickel	μg/L		40 <i>U</i>	40 U	40 U	40 <i>U</i>	4 0 <i>U</i>	40 U	40 <i>U</i>	40 <i>U</i>
Thallium	$\mu\mathrm{g/L}$	2	0.2 <i>U</i>	0.2 <i>U</i>	0.2 <i>U</i>	0.2 <i>U</i>	0.2 <i>U</i>	0.2 <i>U</i>	0.2 <i>U</i>	0.2 <i>U</i>
Vanadium	μ g/L		50 <i>U</i>	50 <i>U</i>	50 <i>U</i>	62.9	50 <i>U</i>	50 <i>U</i>	50 <i>U</i>	50 <i>U</i>

Note: -- - no criterion for this analyte

- indicates that the compound was analyzed for but not detected

J - indicates an estimated concentration

dup - duplicate sample

U

MCL - U.S. Environmental Protection Agency drinking water standard maximum contaminant level

SFI - supplemental field investigation

Boxed entries indicate measurements at or above the criteria value.

Table 4. Phase IA SFI groundwater analytical results for perimeter wells with SWQS comparisons

				Sample Locati	on and Date of Sa	mple Collection		-		
A1.4-	Linite	NJ SWQS	MW-1 GW0302 9/24/2002	MW-3 GW0306 9/25/2002	MW-4 GW0305 9/25/2002	MW-5 GW0303 9/25/2002	MW-6 GW0310 9/26/2002	MW-8 GW0313 9/26/2002	MW-12 GW0307 9/25/2002	MW-15 GW0317 9/27/2002
Analyte letals	Units	37703	9/24/2002	9/23/2002	9/23/2002	512312002	9/20/2002	5/20/2002	3/23/2002	3/2//2002
Arsenic	μg/L	0.017	3.21 <i>U</i>	2.52 U	2.82 <i>U</i>	3.01 ∪	12.2	4.89 <i>U</i>	3.25 <i>U</i>	10.9
Barium	μ g/L	2,000	493	150	592	670	194	395	90.3	75.4
Cadmium	μ g/L	10	0.5 <i>U</i>	0.5 U						
Copper	μ g/L		20 <i>U</i>	20 <i>U</i>	20 <i>U</i>	20 <i>U</i>	20 <i>U</i>	20 <i>U</i>	20 <i>U</i>	20 U
Iron	μ g/L		18,100	15,800	19,400	20,700	17,300	31,700	100	5,110
Lead	μ g/L	5	5 U	5 U	5 <i>U</i>	5 U	5 U	5 <i>U</i>	5 <i>U</i>	5 0
Manganese	$\mu\mathrm{g/L}$		838	2,820	1,050	1,040	3,730	4,180	182	1,500
Mercury (dissolved, filtered)	μ g/L	0.144	0.002 <i>U</i>	0.010	0.003 <i>U</i>	0.029	0.006 <i>U</i>	0.192	0.027	0.055
Mercury (total, unfiltered)	μ g/L	0.144	0.024	0.070	0.022	0.074	0.069	0.583	0.049	0.345
Nickel	$\mu\mathrm{g/L}$	516	40 <i>U</i>	40 U	40 <i>U</i>	40 U				
Thallium	$\mu\mathrm{g/L}$	1.7	0.2 <i>U</i>	0.2 U						
Vanadium	μ g/L		50 <i>U</i>	50 U						

Note: -- - no criterion for this analyte

U - indicates that the compound was analyzed for but not detected

indicates an estimated concentration

dup - duplicate sample

SFI - supplemental field investigation

SWQS - New Jersey Surface Water Quality Standards for freshwater (NJAC 7:9B; January 1997)

Boxed entries indicate measurements at or above the criteria value.

Shaded entries indicate detection limits at or above the criteria value.

825840026

Table 5. Phase IA SFI borehole soil analytical results with NRDCSCC comparisons

		Sample Location and Date of Sample Collection									
	Units	NJ	B-5 SP0001 10/08/02	B-5 SP0002 10/08/02	B-5 SP0003 10/08/02	B-5 SP0004 10/09/02	B-9 SP0005 10/09/02	B-9 SP0006 10/09/02	B-9 SP0007 10/09/02	B-10 SP0013 10/09/02	B-10 (dup) SP0014 10/09/02
Analyte	(dry wt.)	NRDCSCC	6 - 7 ft	7 - 8 ft	8 - 9 ft	9 - 10 ft	0 - 2 ft	2 - 4 ft	4 - 6 ft	0 - 2 ft	0 - 2 ft
Conventional parameters		HINDOCCO				<u> </u>		- ' ' ' '			
Total solids	%		79.9	83.0	86.9	80.3	77.8	85.2	80.7	85.4	87.7
Metals											
Arsenic	mg/kg	20									
Barium	mg/kg	40,100									
Cadmium	mg/kg	100									
Chromium	mg/kg										
Copper	mg/kg	600									
Iron	mg/kg										
Lead	mg/kg	600									
Manganese	mg/kg										
Mercury (total)	mg/kg	270	750	128	252	12.3	240	0.21	0.09	13.3 <i>J</i>	31.7 <i>J</i>
Nickel	mg/kg	2,400									
Selenium	mg/kg	3,100									
Silver	mg/kg	4,100									
Thallium	mg/kg	2									
Zinc	mg/kg	1,500									
Volatile organic compour	nds										
Benzene	μg/kg	13,000									
Chlorobenzene	µg/kg	680,000									
meta & para Xylenes	µg/kg	1,000,000									
ortho-Xylene	μg/kg	1,000,000									
Toluene	μ g/kg	1,000,000									

825840027

Table 5. (cont.)

		Sample Location and Date of Sample Collection												
	Units	NJ	B-10 SP0015 10/09/02	B-10 SP0016 10/09/02	B-11 SP0018 10/10/02	B-11 SP0019 10/10/02	B-11 SP0020 10/10/02	B-12 SP0023 11/13/02	B-12 SP0024 11/13/02	B-13 SP0038 11/13/02	B-13 SP0039 11/13/02	B-13 SP0040 11/13/02		
Analyte	(dry wt.)	NRDCSCC	4 - 6 ft	8 - 10 ft	0 - 2 ft	4 - 6 ft	6 - 8 ft	0 - 2 ft	4 - 6 ft	0 - 2 ft	2 - 4 ft	4 - 6 ft		
Conventional parameters														
Total solids	%		73.1	84.7	88.5	79.0	81.1	87.1	81.0	87.5	84.4	76.7		
Metals														
Arsenic	mg/kg	20												
Barium	mg/kg	40,100												
Cadmium	mg/kg	100												
Chromium	mg/kg													
Copper	mg/kg	600												
Iron	mg/kg													
Lead	mg/kg	600												
Manganese	mg/kg													
Mercury (total)	mg/kg	270	42.8	0.04 <i>U</i>	2.8	16.6	0.04 <i>U</i>	0.33	0.05	52.6	0.04 <i>U</i>	172		
Nickel	mg/kg	2,400												
Selenium	mg/kg	3,100												
Silver	mg/kg	4,100												
Thallium	mg/kg	2												
Zinc	mg/kg	1,500												
Volatile organic compour	nds													
Benzene	μg/kg	13,000												
Chlorobenzene	μg/kg	680,000												
meta & para Xylenes	μ g/kg	1,000,000												
ortho-Xylene	μg/kg	1,000,000												
Toluene	μg/kg	1,000,000												

Table 5. (cont.)

 				5	Sample Location	on and Date of	Sample Colle	ction	
			B-13	B-13	B-13	B-13	B-14	B-14	B-14
			SP0041	SP0042	SP0043	SP0044	SP0054	SP0055	SP0056
	Units	NJ	11/13/02	11/13/02	11/13/02	11/13/02	11/13/02	11/13/02	11/13/02
Analyte	(dry wt.)	NRDCSCC	6 - 8 ft	8 -10 ft	10 - 12 ft	12 - 14 ft	0 - 2 ft	4 - 6 ft	6 - 8 ft
Conventional parameters									
Total solids	%		78.4	78.9	83.9	83.4	79.1	82.6	80.3
Metals									
Arsenic	mg/kg	20							
Barium	mg/kg	40,100							
Cadmium	mg/kg	100							
Chromium	mg/kg								
Copper	mg/kg	600							
Iron	mg/kg								
Lead	mg/kg	600							
Manganese	mg/kg								
Mercury (total)	mg/kg	270	52.1	35.0	0.75	31.0	67.1	162	0.04
Nickel	mg/kg	2,400							
Selenium	mg/kg	3,100							
Silver	mg/kg	4,100							
Thallium	mg/kg	2							
Zinc	mg/kg	1,500							
/olatile organic compound	s								
Benzene	μ g/kg	13,000							
Chlorobenzene	μg/kg	680,000							
meta & para Xylenes	μ g/kg	1,000,000							
ortho-Xylene	μ g/kg	1,000,000							
Toluene	μ g/kg	1,000,000							

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Notes: -- - no criterion for this analyte

U - indicates that the compound was analyzed for but not detected

J - indicates an estimated concentration

dup - duplicate sample

NRDCSCC - Non-Residential Direct Contact Soil Cleanup Criteria (NJAC 7:26; May 1999)

SFI - supplemental field investigation

Boxed entries indicate measurements at or above the criteria value.

Table 6. Phase IA SFI offsite borehole soil analytical results with RDCSCC comparisons

					S	ample Locatio	n and Date of	Sample Collec	ction		
	Units	NJ	B-9 SP0005 10/09/02	B-9 SP0006 10/09/02	B-9 SP0007 10/09/02	B-10 SP0013 10/09/02	B-10 (dup) SP0014 10/09/02	B-10 SP0015 10/09/02	B-10 SP0016 10/09/02	B-11 SP0018 10/10/02	B-11 SP0019 10/10/02
Analyte	(dry wt.)	RDCSCC	0 - 2 ft	2 - 4 ft	4 - 6 ft	0 - 2 ft	0 - 2 ft	4 - 6 ft	6 - 8 ft	0 - 2 ft	4 - 6 ft
Conventional paran	neters					· ·	•	*			
Total solids	%		77.8	85.2	80.7	85.4	87.7	73.1	84.7	88.5	79.0
Metals Mercury (total)	mg/kg	14	240	0.21	0.09	13.3 <i>J</i>	31.7 J	42.8	0.04 <i>U</i>	2.8	16.6

Table 6. (cont.)

					S	ample Location	n and Date of	Sample Collec	ction		
	Units	NJ	B-11 SP0020 10/10/02	B-12 SP0023 11/13/02	B-12 SP0024 11/13/02	B-13 SP0038 11/13/02	B-13 SP0039 11/13/02	B-13 SP0040 11/13/02	B-13 SP0041 11/13/02	B-13 SP0042 11/13/02	B-13 SP0043 11/13/02
Analyte	(dry wt.)	RDCSCC	6 - 8 ft	0 - 2 ft	4 - 6 ft	0 - 2 ft	2 - 4 ft	4 - 6 ft	6 - 8 ft	8 - 10 ft	10 - 12 ft
conventional parameters											
Total solids	%		81.1	87.1	81.0	87.5	84.4	76.7	78.4	78.9	83.
letals .											
Mercury (total)	mg/kg	14	0.04 <i>U</i>	0.33	0.05	52.6	0.04 <i>U</i>	172	52.1	35.0	0.7

Table 6. (cont.)

				Sampi	e Location and	Date of Sample	Collection
				B-13	B-14	B-14	B-14
				SP0044	SP0054	SP0055	SP0056
		Units	NJ	11/13/02	11/13/02	11/13/02	11/13/02
A	nalyte	(dry wt.) F	RDCSCC	12 - 14 ft	0 - 2 ft	4 - 6 ft	6 - 8 ft
Conven	tional parame	ters					
Total solids		%		83.4	79.1	82.6	80.3
Metals							
M	ercury (total)	mg/kg	14	31.0	67.1	162	0.04
Notes:		- no criterion for	r this analy	rte			
	U	 indicates that 	the compo	ound was ana	lyzed for but no	t detected	
	J	- indicates an e	stimated c	oncentration			
	dup	 duplicate sam 	ple				
	RDCSCC	- Residential Di	rect Conta	ct Soil Clean	up Criteria (NJA	AC 7:26; May 19	99)
	SFI	- supplemental	field invest	tigation			

Boxed entries indicate measurements at or above the criteria value.

825840032

Table 7. Phase IA SFI borehole soil analytical results with SSL comparisons

			Sample Location and Date of Sample Collection										
	Units		B-5 SP0001 10/08/02	B-5 SP0002 10/08/02	B-5 SP0003 10/08/02	B-5 SP0004 10/09/02	B-9 SP0005 10/09/02	B-9 SP0006 10/09/02	B-9 SP0007 10/09/02	B-10 SP0013 10/09/02	B-10 (dup) SP0014 10/09/02		
Analyte	(dry wt.)	SSL	6 - 7 ft	7 - 8 ft	8 - 9 ft	9 - 10 ft	0 - 2 ft	2 - 4 ft	4 - 6 ft	0 - 2 ft	0 - 2 ft		
Conventional paramet													
Total solids	%		79.9	83.0	86.9	80.3	77.8	85.2	80.7	85.4	87.7		
Metals													
Arsenic	mg/kg	1											
Barium	mg/kg	82											
Cadmium	mg/kg	0.4											
Chromium	mg/kg	2											
Copper	mg/kg												
Iron	mg/kg												
Lead	mg/kg	400											
Manganese	mg/kg												
Mercury (total)	mg/kg	0.1	750	128	252	12.3	240	0.21	0.09	13.3 J	31.7 J		
Nickel	mg/kg	7											
Selenium	mg/kg	0.3											
Silver	mg/kg	2											
Thallium	mg/kg	0.04											
Zinc	mg/kg	620											

825840033

Table 7. (cont.)

						Sample Location	on and Date o	of Sample Colle	ction		
		-	B-10	B-10	B-11	B-11	B-11	B-12	B-12	B-13	B-13
			SP0015	SP0016	SP0018	SP0019	SP0020	SP0023	SP0024	SP0038	SP0039
	Units		10/09/02	10/09/02	10/10/02	10/10/02	10/10/02	11/13/02	11/13/02	11/13/02	11/13/02
Analyte	(dry wt.)	SSL	4 - 6 ft	8 - 10 ft	0 - 2 ft	4 - 6 ft	6 - 8 ft	0 - 2 ft	4 - 6 ft	0 - 2 ft	2 - 4 ft
Conventional paramet	ters						-				
Total solids	%		73.1	84.7	88.5	79.0	81.1	87.1	81.0	87.5	84.4
Metals											
Arsenic	mg/kg	1									
Barium	mg/kg	82									
Cadmium	mg/kg	0.4									
Chromium	mg/kg	2									
Copper	mg/kg										
Iron	mg/kg										
Lead	mg/kg	400									
Manganese	mg/kg										
Mercury (total)	mg/kg	0.1	42.8	0.04	U 2.8	16.6	0.04	U 0.33	0.05	52.6	0.04 <i>U</i>
Nickel	mg/kg	7									
Selenium	mg/kg	0.3									
Silver	mg/kg	2									
Thallium	mg/kg	0.04									
Zinc	mg/kg	620									

Table 7. (cont.)

			Sample Location and Date of Sample Collection											
			B-13	B-13	B-13	B-13	B-13	B-14	B-14	B-14				
			SP0040	SP0041	SP0042	SP0043	SP0044	SP0054	SP0055	SP0056				
	Units		11/13/02	11/13/02	11/13/02	11/13/02	11/13/02	11/13/02	11/13/02	11/13/02				
Analyte	(dry wt.)	SSL	4 - 6 ft	6 - 8 ft	8 -10 ft	10 - 12 ft	12 - 14 ft	0 - 2 ft	4 - 6 ft	6 - 8 ft				
Conventional parameters						•								
Total solids	%		76.7	78.4	78.9	83.9	83.4	79.1	82.6	80.3				
Metals														
Arsenic	mg/kg	1												
Barium	mg/kg	82												
Cadmium	mg/kg	0.4												
Chromium	mg/kg	2												
Copper	mg/kg													
Iron	mg/kg													
Lead	mg/kg	400												
Manganese	mg/kg													
Mercury (total)	mg/kg	0.1	172	52.1	35.0	0.75	31.0	67.1	162	0.04				
Nickel	mg/kg	7												
Selenium	mg/kg	0.3												
Silver	mg/kg	2												
Thallium	mg/kg	0.04												
Zinc	mg/kg	620												

Notes: -- - no criterion for this analyte

U - indicates that the compound was analyzed for but not detected

J - indicates an estimated concentration

dup - duplicate sample

SFI - supplemental field investigation

SSL - soil screening level for migration to groundwater with dilution attenuation factor of 1 (U.S. EPA 1996)

Boxed entries indicate measurements at or above the criteria value.

Shaded entries indicate detection limits at or above the critia value.

Appendix A

Laboratory Analytical Data



CEBAM ANALYTICAL, INC.

RESEARCH AND TESTING CHEMISTS

3927 Aurora Ave. N. Seattle, WA 98103

(206) 632-9097 Fax: (206) 632-1947

Email: liang@cebam.net, pang@cebam.net

Web site: www.cebam.net

OCT 1 1 2002

Al Balloni

October 2, 2002

Mr. David Lamadrid Exponent, Inc. 4000 Kruse Way Place, Bldg 2, Suite 285 Lake Oswego, OR 98035

Dear Dr. Henry:

Re: Exponent Exp-02-02 Analytical Report

Enclosed please find the Exponent Exp-02-02 Analytical Report for analysis of 34 water samples received on September 26 and 28, 2002.

Please pay attention to analytical problems described in the case narrative. For future projects, if you could estimate concentration ranges to be similar to this project, please advise us so that we can pre-analyze samples using a less sensitive method prior to analysis using EPA 1631. This would be a great help to prevent the system from contamination and get samples analyzed at optimal range of EPA 1631.

If you have any questions, please contact me.

Thank you for your projects.

Sincerely,

Lian Liang, Ph.D.

Senior Research Scientist

Enclosures: Case narrative Table of results Analytical sheet

Analyzer computer printouts

COC forms

Analysis of Water Samples for Total Mercury (THg) by EPA 1631

A case narrative for Exp-02-02 Report Project: Wood-Ridge / 8600B3N.005 Lian Liang, Cebam Analytical, October 2, 2002

1. Description and processing of samples

Thirty four water samples were received in two batches in good conditions on September 26 and 28, 2002. The inside temperature of coolers was below 2C. Samples were prepared at the same day of sample receipt, and analyzed on September 30 and October 1, 2002. Results were reported on October 2, 2002.

Most of samples contain a lot of yellow, or orange precipitate as received.

2. Sample preparation and analysis

Samples were prepared by adding BrCl directly into sample bottles. After adding BrCl, precipitate was dissolved, while formation of a lot of gas bubbles was observed. Samples were allowed to stay at room temperature for 2 days for digestion, and shaken periodically to free gas bubbles.

The digestates were analyzed by EPA 1631, oxidation, SnCl₂ reduction, purge, trap, and CVAFS detection.

3. QA measurements:

WS-68 PE water sample was used for QA purpose.

Matrix spike (MS), and duplicate samples were prepared and analyzed for monitoring the accuracy and precision according to EPA 1631. In addition, ongoing precision samples, lowest standard (50 pg), bubbler blanks were prepared and analyzed as requested by EPA method 1631 for analysis of THg.

4. Acceptance of results

All results of QC measurements were acceptable.

5. Contamination

Method blank was found to be lower than method detection limit, indicating no significant contamination was made during analyses.

6. Analytical problems

Some samples were unexpectedly high in Hg resulting in contamination of the analytical system. It took 3 hours to decontaminate the system and get it back to work. Since Hg concentrations of samples ranged from sub-ppt to tens of ppb, to protect the system from contamination and get samples analyzed at the optimal concentration range of the method, all samples were pre-analyzed using less sensitive EPA 245.7, and then analyzed using appropriate sample sizes by EPA 1631. Some low concentration samples were analyzed using about 100 mL while the highest concentration sample was analyzed using 0.1 mL only.

Analytical Shee	et .					1	
Project: Expone		Нg				1	
Date: 10/1/02, S			/02				
CF: 0.286+/-0.0							
BB: 75+/-30	,						
Sample ID		Vol. Anal.,mL	BrCl, pg	PA	CF	THg, ng/L	% Rec.
1000	PG		,,,,,	3384		3, 13.	
	PG			291			
100				412			
500				1872			
2000				6361			
4000				14002			
EXP-02-02-15	 	81.2	30	471		1.03	
BB		01.2		120	<u> </u>	1.00	
OPR1		100	20	1659		4.33	86.6
BB		100	20	61		7.00	00.0
EXP-02-02-7		63.4	20	7011	1	30.97	
EXP-02-02-8		63.5	20	11378		50.59	
EXP-02-02-9		67.4	20	751		2.57	
EXP-02-02-10		68.2	20	5488		22.41	
EXP-02-02-15		106.3	40	664		1.21	
EXP-02-02-15		104.4	40	455		0.66	
CF: 0.392+/-0.0	14/2 70/ \	104.4	40	455	-	0.00	
EXP-02-02-11	11(2.770)	80.8	30	2127	<u> </u>	9.58	
6000	DC	00.0	30	16077	4	9.56	
EXP-02-02-1	PG	84.3	30	654		2.34	
EXP-02-02-1		89.3	30	4087		17.28	
EXP-02-02-2 EXP-02-02-33		98.6		>2M		17.20	
15000	DC.	30.0	40	38048	0.395		
EXP-02-02-3	P.G	83.8	30			1.52	
EXP-02-02-3		84.5	30	5247		23.64	
EXP-02-02-4 EXP-02-02-5		86.2	30	6480		28.78	
EXP-02-02-5		80	30	15249	1	73.98	
EXP-02-02-07		95.6	40	8322		33.40	
EXP-02-02-17		88.7	30	8090		35.40	
EXP-02-02-18		93.4	40	1552		5.77	
EXP-02-02-19		83.9	30	14922		69.01	
EXP-02-02-20		96.3		>2M		09.01	
EXP-02-02-21		92.7		>2M			
BB		92.1	40	63			
MB	· · ·	100	40	164		0.05	
EXP-02-02-30		0.1	40	5919		-0.05 22908.48	
EXP-02-02-30		0.1		6478		12549.88	
EXP-02-02-29		0.2		7081		5492.70	
EXP-02-02-34		0.5		4994		3856.50 6161.46	
EXP-02-02-22		0.5		7934			
EXP-02-02-33		3		6518		841.89	
EXP-02-02-21		3		8211		1063.10	
EXP-02-02-27		4	-	6028		583.39	
EXP-02-02-32		5		5259		406.43	
EXP-02-02-36		5		4474	 	344.88	
EXP-02-02-23		5		8205		637.39	

Sample ID		Vol. Anal.,mL	BrCl, pg	PA	CF	THg, ng/L	% Rec.
EXP-02-02-25		10		4965		191.69	
EXP-02-02-35		30	10	4336		55.34	
EXP-02-02-20		30	10	5030		64.41	
EXP-02-02-17		50	15	3997		30.45	
EXP-02-02-18		50	15	4214		32.15	-
EXP-02-02-14		30	10	3854		49.05	
EXP-02-02-13		50	15	3526		26.76	
EXP-02-02-25+	200	10		9775		380.24	94.3
EXP-02-02-27+	500	4		10892		1060.07	95.3
EXP-02-02-1+	10.2	98	40	2948		11.08	85.7
EXP-02-02-3+	10.38	96.3	40	2972		11.38	95
EXP-02-02-31		15		5060		130.27	
EXP-02-02-12		50	15	9053		70.09	
WS-68	8.93ug/L	0.2		4520		8712.20	97.8
OPR2		100	20	1387		4.94	98.8
BB				55			
1000	PG			2569	0.401		
1000	PG			2577	0.400		
1000	PG			2650	0.388		
					0.396+/-0.0	07(1.8%)	-

825840040

Analytical Report to Exponent	Analytica	l Report	to Expor	nent
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Project: Wood-Ridge / 8600B3N.005

Water -Total mercury (THg) by EPA 1631

Sample received: September 26-28, 2002

Prepared and analyzed: September 26-October 1, 2002

Report NO.: Exp-02-02 Report date: October 2, 2002

Prepared by Lian Liang Ph. D., Cebam Analytical, Inc.

Sample ID-Tag No.	Lab ID	THg, ng/L as Hg	Dup	Mean	RPD	MS	Spike level	Rec., %
GW0301-47504	EXP-02-02-01	2.34		- IIIOUII		11.08	10.2	85.7
GW0301-47505	EXP-02-02-02	17.28		<u> </u>			· · · · · ·	
GW0301-47508	EXP-02-02-03	1.52		 		11.38	10.38	95
GW0302-47509	EXP-02-02-04	23.64		-				+
GW0303-47512	EXP-02-02-05	28.78						†
GW0303-47513	EXP-02-02-06	73.98						
GW0304-47518	EXP-02-02-07	30.97						
GW0304-47519	EXP-02-02-08	50.59		 			· · · · · · · · · · · · · · · · · · ·	
GW0305-47522	EXP-02-02-09	2.57						
GW0305-47523	EXP-02-02-10	22.41						
GW0306-47526	EXP-02-02-11	9.58				<u>-</u> -		
GW0306-47527	EXP-02-02-12	70.09				-		
GW0307-47530	EXP-02-02-13	26.76						
GW0307-47531	EXP-02-02-14	49.05	,					
GW0308-47536	EXP-02-02-15	1.21	1.03	1.12	15.9			
GW0308-47537	EXP-02-02-16	0.66						
GW0309-45740	EXP-02-02-17	33.40	30.45	31.92	9.2			
GW0309-45741	EXP-02-02-18	35.08	32.15	33.62	8.7			
GW0310-45744	EXP-02-02-19	5.77						
GW0310-45745	EXP-02-02-20	69.01	64.41	66.71	6.9			<u> </u>
GW0311-45748	EXP-02-02-21	1063.10						
GW0311-45749	EXP-02-02-22	6161.46					 	
GW0312-45752	EXP-02-02-23	637.39					 	

		THg, ng/L as					Spike	
Sample ID-Tag No.	Lab ID	Hg	Dup	Mean	RPD	MS	level	Rec., %
GW0312-45753	EXP-02-02-24	5492.70						
GW0313-45758	EXP-02-02-25	191.69				380.24	200	94.3
GW0313-45759	EXP-02-02-26	For MS						
GW0313-45760	EXP-02-02-27	583.39				1060.07	500	95.3
GW0313-45761	EXP-02-02-28	For MS						
GW0314-45764	EXP-02-02-29	12549.88						
GW0314-45765	EXP-02-02-30	22908.48						
GW0315-45768	EXP-02-02-31	130.27						
GW0315-45769	EXP-02-02-32	406.43						
GW0316-45772	EXP-02-02-33	841.89						
GW0316-45773	EXP-02-02-34	3856.50		1				
GW0317-45776	EXP-02-02-35	55.34						
GW0317-45777	EXP-02-02-36	344.88						
	OPR1	4.33					5.0	86.6
	OPR2	4.94					5.0	98.8
	WS-68	8712.20					8930	97.8
	MB	<0.2						1
	MDL	0.2		<u> </u>	†			

Project: (Name and Number)	Wood-Ri	de 1	18600	B3N.	200								$\mathbf{E}^{\mathbf{x}}$ ponent
Exponent Contact:	Belsy Honry	,	Offic	ce:Albini	Samplers:	RRK J	USUN!	erane U	Jents.				Bellevue, WA (425) 643-9803
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Lab Contact/Phone:	Ms. LIAN	Liang/	101-63	54709/	FFA 1431				Ì	1 00	<u>2</u>	Archive	(425) 643-9803 Boston, MA (781) 466-6681 Boulder, CO (303) 444-7270 Portland, OR (503) 636-4338 Washington, D.C.
Sample No.	Tag No.	Date	Time	Matrix	宣布				ļ I	LAB	Extra	Arc	(301) 577-7830 Remarks
6W0308	47536	26.5 gr or	0745	6W	X		Ţ <u></u>			Exp-02-0	-15		Pitwed
V	47537				X					/	-16		whiteked
6W0309	45740		1240		X						-17		filtued
	45741		V		X						18		millere
6W031D	45744		1335								-19		Ultired
<u> </u>	45745	\bot	1.4.		X	ļ	ļ				-20	<u> </u>	inf. Here's
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6W0312	45752	 	1715		>	 	<u> </u>		ļ	 	-23	ļ	6. Hive 2
V 0312	45753	-	1775		X	<u> </u>	<u> </u>	ļ	 	 	-24		inhilited
6W 0313	45758	1	1755	 	<u> </u>	}		 	· · · · · · · · · · · · · · · · · · ·	 	-75		filtures
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39271	JUL AVOUR LIVE	2 N.			2) [1	Ţ ,	Ţ	[Jer		(/81) 466-6681 Boulder, CO
Scalile	Q ALLL	XIOS			SS SE						ntai		(303) 444-7270 E Portland, OR
Lab Contact/Phone:	MAS LIMAN L	ions/2	06-632-	9097	EPQ 1631 TORAL MESCURY						Extra Container	<u>×</u>	Boulder, CO (303) 444-7270 (303) 444-7270 (503) 636-4338 (503) 636-4338 (301) 577-7830
			C \		FPA i					İ	xtra	Archive	(301) 577-7830
Sample No.	Tag No.	Date	Time	Matrix	T (2)						w		Remarks
6W0301	147504	24-Sep- (1715	GW	X			<u> </u>					EXP-02-02-1
<u> </u>	47505				X			<u> </u>	<u></u>				2
6W030Z	147508		1720		X							<u> </u>) 3
	47509	V	4		X								Ú
6110303	4751L	75-50-02	1000		X								5
J.	47513		V		X					<u> </u>			
6W0304	47518		1230		X								
Ī	47519	17	1		X								1
GW0305	47522		1405		X								
4	47523		4		X								L
GW0306	47526		1720		X								1
Ą	17527		4		X								
Sh10307	47530		1750		X								
4	47531	I V	V		X								l V I
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		<u> </u>			<u> </u>								
		<u> </u>	ļ	L									
Matrix Code: GW - Ground	lwater SL - So	il SD - S	ediment	SW - Sur	face water	Priority	•		<u>-</u>				
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Distribution: White and Yellow Copies - Accompany Shipment; Pink Copy - Project File



A FULL SERVICE ENVIRONMENTAL LABORATORY

October 25, 2002

Mr. Dave Lamadrid
Exponent
4000 Kruseway Place
Bldg 2, Suite 285
Lake Oswego, OR 97035

PROJECT: WOOD-RIDGE, NJ Submission #:R2214005

Dear Mr. Lamadrid:

Enclosed are the analytical results of the analyses requested. The analytical data was provided to you on 10/24/02 per a Facsimile transmittal. All data has been reviewed prior to report submission.

Should you have any questions please contact me at (585) 288-5380.

Thank you for letting us provide this service.

Sincerely,

COLUMBIA ANALYTICAL SERVICES

Michael Perry

Laboratory Director

Enc.



1 Mustard ST. Suite 250 Rochester, NY 14609 (585) 288-5380

THIS IS AN ANALYTICAL TEST REPORT FOR:

Client : Exponent

Project Reference: WOOD-RIDGE, NJ

Lab Submission # : R2214005

Project Manager : Michael Perry

Reported : 10/25/02

Report Contains a total of 144 pages

The results reported herein relate only to the samples received by the laboratory. This report may not be reproduced except in full, without the approval of Columbia Analytical Services.

This package has been reviewed by Columbia Analytical Services' QA Department/Laboratory Director to comply with NELAC standards prior to report submittal.

SDG NARRATIVE

CASE NARRATIVE

COMPANY: Exponent Project: Wood-Ridge, NJ SDG#: GW0301 SUBMISSION #: R2214005

NYS DEC water samples were collected the week of 09/24/02 -09/27/02 and received at CAS in good condition on 09/28/02. See CAS CLP Batching sheets for a cross-reference between Client ID and CAS Job # and analyses requested. A NJ Reduced Deliverables package has been provided.

METALS ANALYSIS

Seventeen water samples were analyzed for a site-specific list of (7) Total Metals using SW-846 ICP method 6010B.

The initial and continuing calibration criteria were met for all analytes.

The matrix spike and duplicate analyses was performed on sample GW0313. The blank spike recoveries (LCS) were all within QC limits of 80 – 120 %. All Matrix Spike Recoveries were within QC limits of 75 – 125 %... The Spiked Sample Recovery for Iron could not be accurately determined since the amount detected in the sample was greater than four times the spike amount added. The % RPD's from the duplicate analyses were all within QC limits.

No other analytical or QC problems were encountered.

SDG #: GW0301 BATCH COMPLETE: yes DATE REVISED: DISKETTE REQUESTED: Y_x__ N____ SUBMISSION R2214005 DATE DUE: 10/26/02 CLIENT: Exponent DATE: 10/02/02 PROTOCOL: NJ Reduced CLIENT REP: Michael Perry CUSTODY SEAL: PRESENT SHIPPING No.: PROJECT: SUMMARY PKG: Y x N WOOD-RIDGE, NJ CHAIN OF CUSTODY: PRESENT REMARKS CAS JOB # | CLIENT/EPA ID MATRIX REQUESTED PARAMETERS DATE DATE рH SAMPLED RECEIVED (SOLIDS | SOLIDS | SAMPLE CONDITION METALS BY 6010B 9/24/02 9/28/02 588686 GW0301 WATER 588687 GW0302 WATER METALS BY 6010B 9/24/02 9/28/02 588688 GW0303 WATER METALS BY 6010B 9/25/02 9/28/02 588689 GW0304 9/25/02 9/28/02 WATER METALS BY 6010B 588690 GW0305 WATER METALS BY 6010B 9/25/02 9/28/02 588691 9/25/02 9/28/02 GW0306 WATER METALS BY 6010B 588692 GW0307 WATER METALS BY 6010B 9/25/02 9/28/02 588693 GW0308 WATER 9/26/02 9/28/02 METALS BY 6010B 588694 GW0309 WATER METALS BY 6010B 9/26/02 9/28/02 9/26/02 9/28/02 588695 GW0310 WATER METALS BY 6010B 588696 GW0311 WATER METALS BY 6010B 9/26/02 9/28/02 9/26/02 9/28/02 588697 GW0312 WATER METALS BY 6010B 588698 GW0313 WATER METALS BY 6010B 9/26/02 9/28/02 +QC 588699 9/26/02 9/28/02 GW0314 WATER METALS BY 6010B 588700 GW0315 WATER METALS BY 6010B 9/27/02 9/28/02 588701 9/27/02 9/28/02 GW0316 WATER METALS BY 6010B 588702 GW0317 WATER METALS BY 6010B 9/27/02 9/28/02 BA - 20 UG/L CU - 20 UG/L FE - 100 UG/L MN - 10 UG/L NT - 40 UG/L V - 50 UG/L PB - 5 UG/L







Effective 6/28/2002

INORGANIC QUALIFIERS

C (Concentration) qualifier -

- B if the reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but was greater than or equal to the Instrument Detection Limit (IDL).
- U if the analyte was analyzed for, but not detected

Q qualifier - Specified entries and their meanings are as follows:

- E The reported value is estimated because of the presence of interference.
- J Estimated Value
- M Duplicate injection precision not met.
- N Spiked sample recovery not within control limits.
- S The reported value was determined by the Method of Standard Additions (MSA).
- W Post-digestion spike for Furnace AA Analysis is out of control limits (85-115), while sample absorbance is less than 50% of spike absorbance.
- * Duplicate analysis not within control limits.
- +- Correlation coefficient for the MSA is less than 0.995.

M (Method) qualifier:

- "P" for ICP
- "A" for Flame AA
- "F" for Furnace AA
- "PM" for ICP when Microwave Digestion is used
- "AM" for Flame AA when Microwave Digestion is used
- "FM" for Furnace M when Microwave Digestion is used
- "CV" for Manual Cold Vapor AA
- "AV" for Automated Cold Vapor AA
- "CA" for Midi-Distillation Spectrophotometric
- "AS" for Semi-Automated Spectrophotometric
- "C" for Manual Spectrophotometric
- "T" for Titrimetric
- " " where no data has been entered
- "NR" if the analyte is not required to be analyzed.

CAS/Rochester Lab ID # for State Certifications

Army Corp of Engineers Validated
Delaware Accredited
Connecticut ID # PH0556
Florida ID # E87674
Massachusetts ID # M-NY032
Navy Facilities Engineering Service Center Approved
Nebraska Accredited

NELAP Accredited New York ID # 10145 New Jersey ID # NY004 New Hampshire ID # 294100 A/B Rhode Island ID # 158 South Carolina ID #91012 West Virginia ID # 292

CHAINS OF CUSTODY INTERNAL CHAINS

CHAIN OF	CUSTO	DY R	ECO	RD/S	AMPLE	EANA	LYSIS	REQU	EST F	ORM	_		Page of
Project: (Name and Number)	Wood-Ri	Sae	8600	B3N	.005					-			E ^x ponent
Exponent Contact: 50	3134 Henry	· · · · · · · · · · · · · · · · · · ·	Offic		Samplers:	Rick Jo	ensen /	Terame	Montz				Bellevue, WA (425) 643-9803
Ship to: Columbi	a Avaly hox	al Jewi			/		Analyses R		NA ALIX				Boston, MA
1 Musti		L. Suite	c 250		377						itainer		
	MINO PUI		-528-	5380	EPA 6010/7000 TOTAL BY, CU, FC, MAN, NI,						Extra Container	Archive	Boulder, CO (303) 444-7270 CO (303) 444-7270 CO (503) 636-4338 CO (301) 577-7830
Sample No.	Tag No.	Date	Time	Matrix	型をなう	i					Ä	¥	Remarks
GW0301	47502-	24-509-00	1220	GW	X			1	<u> </u>	1			Note: All samples are
6W0302	47507	¥ '	1720		Х								unfiltered
600303 600303	4751	25-50-02	1000		X								
5120304	47517	1,	1230		X								
640305 640305	47521		1405		Х								
<u> </u>	47525		1720		X				ļ	<u> </u>			
6W0307 6W0308	47529	L.V	1750		X			ļ				ļ	
200308 W	47533				X		\			.		ļ	
6W0309 25T	45738	9	1240		X				ļ		_		
6W0310 1	45743		1335	$oxed{oldsymbol{oldsymbol{oldsymbol{eta}}}$	X		ļ	ļ	ļ	<u> </u>			
640311	45747		1705		X			<u> </u>	ļ	<u> </u>			
6W0317	145/51		1715		X		<u> </u>					ļ	
6W0313	45756		1755		X							<u> </u>	
(W) 0514	45763	$\perp \vee$	1940		X		1					<u> </u>	
6010315	45767	27-5-1-6	T		X			<u> </u>		<u> </u>		ļ	
GW10316	45771		1100	 	X		ļ	<u> </u>				ļ	
5W0317	45775	I V	1315	LV.	X							<u> </u>	
5W18313	45757	26-50-R	1755	CNJ			ļ	-		<u>, </u>	X	ļ. <u></u>	Please use for MS
				 				m	Old	12 27	7-5-P	_	
							1				1		
Oodc.	water SL - So		ediment	SW - Su	ırface water	Priority:	Normal	Rus	h Rush	time period		Ra	22-14005
Chinand .—	ase identify code					Condition	of Samples	5°C		T	Custody Se	eal Intac	et: Yes No None
via: Fede	x/UPS Cou	rier Other	T		22	Upon Rec		<u> </u>	Ev.				
Relinquished by:	NIC //	ignature)			ate/Time: 27	2 of-ac 10	UU Receive	d by: <u>Fed</u>	レス	(Signature)		•	_ Date/Time: <u>27-54-0 /90</u> 0
Relinquished by:		ignature)			oate/Time:		Received	d by: 🖳	D XM	(Elmature)	CAS		Date/Time: 9/28/02 1030
825840	052		~	اه. ريالسفي	. Milian and W	allam Canica	A	Chinana N		•			3010

Page ____ of ___

Cooler Receipt And Preservation Check Form

ProjecuchentE	xponent			Submiss	ion Nun	nber_R2-1400C	<u>.</u> .	
Cooler received on	0402 by:9	pelce	_cou	RIER:	CAS	UPS FEDEX	CD&L	CLIENT
 Were custod Did all bottl Did any VO Were Ice or Where did t 	dy seals on outside dy papers properly les arrive in good o A vials have signi Ice packs present he bottles originate e of cooler(s) upon	filled condition ficant?	out (ini on (unt air bub	oroken)?		YES YES YES YES CAS/RO	NO NO NO NO	N/A ONLY
Is the tempe	rature within 0° -	5° C?:		Yes	Yes	Yes	Yes	Yes
lf No, Expl	ain Below			No	No	No	No	No
	Cemperatures Take er ID: 161 or (1105 From:		r Sam	ple Bottle
If out of Temperat	ure, Client Appr	oval to	Run !	Samples	ī	····		· · · · · · · · · · · · · · · · · · ·
 Did all bottle Were correct 	tle labels complete e labels and tags ag t containers used f : Cassettes / Tub	e (i.e. a gree was or the	nalysis ith cust lests in	tody pap dicated?	ers?	YES	NO NO NO Bags Infla	ated N/A
		YES	NO	Sample	I.D.	Reagent	Vol. A	Added
рН	Reagent	YES	NO	Sample	I.D.	Reagent	Vol. A	Added
		YES	NO	Sample	I.D.	Reagent	Vol. /	Added
рН	Reagent	YES	NO	Sample	I.D.	Reagent	Vol. /	Added
pH 12	Reagent NaOH		NO	Sample	I.D.	Reagent	Vol. /	Added
pH 12 2	Reagent NaOH HNO ₃ H ₂ SO ₄		NO	Sample	I.D.	Reagent	Vol. /	Added
pH 12 2 2	Reagent NaOH HNO ₃ H ₂ SO ₄		NO	Sample	1.D.	Reagent	Vol. /	Added
pH 12 2 2 Residual Chlorine (+/-) 5-9** YES = All samples OK	Reagent NaOH HNO ₃ H ₂ SO ₄ for TCN & Phenol P/PCBs (608 only) NO = Sam	ples wer				Reagent PC OK to adjust		Added
pH 12 2 2 Residual Chlorine (+/-) 5-9** YES = All samples OK **If pH adjustment is req VO	Reagent NaOH HNO ₃ H ₂ SO ₄ for TCN & Phenol P/PCBs (608 only) NO = Sam	ples wer						Added

Chain of	Custody					
Submission:	R2214005	Client:				
Lab ID:	588686	Matrix	WATER			
Received into CA	S-Rochester Cust	ody: 9/28	3/02 10:30:00 A	······································	***************************************	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Container:	5886861					
Date of Custody	User	Dept		Storage Location	Purpose	Empty
09/30/02 11:53	gesmeria	Sample I	Management	Ambient 1	Storage	
10/14/02 14:09	tmccarth	Metals		Ambient 1	Analysis	
10/14/02 14:16	tmccarth	Metals		LTS	Storage	
Lab ID:	588687	Matrix	WATER			
Received into CA	S-Rochester Cust	ody: 9/28	/02 10:30:00 A			
Container:	5886871					
Date of Custody	User	Dept		Storage Location	Purpose	Empty
09/30/02 11:53	gesmeria	Sample I	Management	Ambient 1	Storage	
10/14/02 14:09	trnccarth	Metals		Ambient 1	Analysis	
10/14/02 14:16	tmccarth	Metals		LTS	Storage	
Lab ID:	588688	Matrix	WATER			
Received into CA	S-Rochester Custo	ody: 9/28	/02 10:30:00 A		~~~~	·····
Container:	5886881					
Date of Custody	User	Dept		Storage Location	Purpose	Empty
09/30/02 11:53	gesmeria	Sample N	/lanagement	Ambient 1	Storage	
10/14/02 14:09	traccarth	Metals		Ambient 1	Analysis	
10/14/02 14:16	tmccarth	Metals		LTS	Storage	
Lab ID:	588689 S-Rochester Custo	Matrix	WATER /02 10:30:00 A			
					·····	······································
Container:	5886891					
Date of Custody	User	Dept		Storage Location	Purpose	Empty
09/30/02 11:53	gesmeria	Sample N	/lanagement	Ambient 1	Storage	

0009

10/14/02 14:09

10/14/02 14:16

tmccarth

tmccarth

Metals

Metals

Analysis

Storage

Ambient 1

LTS

Submission:	R2214005	Client:				
Submission:	R2214005	Citent.				
Lab ID:	588690	Matrix	WATER			
Received into CA	S-Rochester Custo	ody: 9/28/	02 10:30:00 A	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		******************************
Container:	5886901					
Date of Custody	User	Dept		Storage Location	Purpose	Empty
09/30/02 11:53	gesmeria	Sample Ma	anagement	Ambient 1	Storage	
10/14/02 14:09	tmccarth	Metais		Ambient 1	Analysis	
10/14/02 14:17	tmccarth	Metals		LTS	Storage	
Lab ID:	588691	Matrix	WATER			
Received into CA	S-Rochester Custo	ody: 9/28/	02 10:30:00 A			
Container:	5886911					
Date of Custody	User	Dept		Storage Location	Purpose	Empty
09/30/02 11:53	gesmeria	Sample M	anagement	Ambient 1	Storage	
10/14/02 14:09	traccarth	Metals		Ambient 1	Analysis	
10/14/02 14:17	tmccarth	Metals		LTS	Storage	
Lab ID:	588692	Matrix	WATER			
Received into CA	S-Rochester Custo	ody: 9/28/	02 10:30:00 A	······	······································	•••••
Container:	5886921					
Date of Custody	User	Dept		Storage Location	Purpose	Empty
09/30/02 11:53	gesmeria	Sample M	anagement	Ambient 1	Storage	
10/14/02 14:09	tmccarth	Metals		Ambient 1	Analysis	
10/14/02 14:17	tmccarth	Metals		LTS	Storage	
Lab ID: Received into CA	588693 AS-Rochester Custo	<i>Matrix</i> odv: 9/28/	WATER 02 10:30:00 A			
Container:	5886931					***************************************
Date of Custody	User	Dent		Storage Location	Purnose	Emnt.
09/30/02 11:52	gesmeria	Dept Sample M	anagement	Ambient 1	Purpose Storage	Empty
10/14/02 14:09	tmccarth	Metals	-	Ambient 1	Analysis	
10/14/02 14:03	tmccarth	Metals		LTS		
10/14/02 14.17	unccarui	ivicials		LIS	Storage	\sqcup

Page 2 of 5

Submission:	R2214005	Client:				
Lab ID:	588694	Matrix	WATER			
Received into CA	S-Rochester Custo	ody: 9/28	3/02 10:30:00 A			***********************
Container:	5886941					
Date of Custody	User	Dept		Storage Location	Purpose	Empty
09/30/02 11:52	gesmeria	Sample I	Management	Ambient 1	Storage	
10/14/02 14:09	tmccarth	Metals		Ambient 1	Analysis	
10/14/02 14:17	tmccarth	Metals		LTS	Storage	
Lab ID:	588695	Matrix	WATER			
Received into CA	S-Rochester Custo	ody: 9/28	3/02 10:30:00 A			***************************************
Container:	5886951					
Date of Custody	User	Dept		Storage Location	Purpose	Empty
09/30/02 11:52	gesmeria	Sample I	Management	Ambient 1	Storage	
10/14/02 14:09	trnccarth	Metals		Ambient 1	Analysis	
10/14/02 14:17	tmccarth	Metals		LTS	Storage	
Lab ID:	588696	Matrix	WATER			
~~~~	S-Rochester Custo	ody: 9/28	3/02 10:30:00 A		·····	***************************************
Container:	5886961					
Date of Custody	User	Dept		Storage Location	Purpose	Empty
09/30/02 11:52	gesmeria	Sample I	Management	Ambient 1	Storage	
10/14/02 14:09	tmccarth	Metals		Ambient 1	Analysis	
10/14/02 14:17	tmccarth	Metals		LTS	Storage	
Lab ID:	588697	Matrix	WATER			
Received into CA	S-Rochester Custo	ody: 9/28	/02 10:30:00 A		***************************************	***************************************
Container:	5886971					
Date of Custody	User	Dept		Storage Location	Purpose	Empty
09/30/02 11:52	gesmeria	Sample N	Management	Ambient 1	Storage	
10/14/02 14:09	tmccarth	Metals		Ambient 1	Analysis	

10/14/02 14:17

tmccarth

Metals

Storage

LTS

Submission:	R2214005	Client:			
Lab ID:	588698	<i>Matrix</i> WATER			
Received into CA	S-Rochester Custo	ody: 9/28/02 10:30:0	00 A		
Container:	5886981				
Date of Custody	User	Dept	Storage Location	Purpose	Empty
09/30/02 11:52	gesmeria	Sample Management	Ambient 1	Storage	
10/14/02 14:09	tmccarth	Metals	Ambient 1	Analysis	
10/14/02 14:17	tmccarth	Metals	LTS	Storage	
Container:	5886982			***************************************	***************************************
Date of Custody	User	Dept	Storage Location	Purpose	Empty
09/30/02 11:52	gesmeria	Sample Management	Ambient 1	Storage	<del></del>
10/14/02 14:09	tmccarth	Metals	Ambient 1	Analysis	
10/14/02 14:17	tmccarth	Metals	LTS	Storage	
Lab ID:	588699	Matrix WATER	L.		
	588699 \S-Rochester Custo				
Received into CA	S-Rochester Custo			Purpose	Empty
Received into CA	AS-Rochester Custo 5886991	ody: 9/28/02 10:30:	00 A	Purpose Storage	Empty
Received into CA  Container:  Date of Custody	S-Rochester Custo 5886991 User	pdy: 9/28/02 10:30:0	00 A Storage Location	<del> </del>	
Container: Date of Custody 09/30/02 11:52	S-Rochester Custo 5886991 User gesmeria	Dept Sample Management	OO A  Storage Location Ambient 1	Storage	
Received into CA  Container:  Date of Custody 09/30/02 11:52 10/14/02 14:09 10/14/02 14:17	5886991  User gesmeria tmccarth tmccarth	Dept Sample Management Metals Metals	Storage Location Ambient 1 Ambient 1 LTS	Storage Analysis	0
Received into CA  Container:  Date of Custody 09/30/02 11:52 10/14/02 14:09 10/14/02 14:17	S-Rochester Custo 5886991 User gesmeria tmccarth	Dept Sample Management Metals	Storage Location Ambient 1 Ambient 1 LTS	Storage Analysis	
Received into CA  Container:  Date of Custody 09/30/02 11:52 10/14/02 14:09 10/14/02 14:17  Lab ID:	5886991  User gesmeria tmccarth tmccarth	Dept Sample Management Metals Metals Matrix WATER	Storage Location Ambient 1 Ambient 1 LTS	Storage Analysis Storage	
Received into CA  Container:  Date of Custody 09/30/02 11:52 10/14/02 14:09 10/14/02 14:17  Lab ID:	S-Rochester Custo  5886991  User  gesmeria  tmccarth  tmccarth	Dept Sample Management Metals Metals Matrix WATER	Storage Location Ambient 1 Ambient 1 LTS	Storage  Analysis  Storage	
Received into CA  Container:  Date of Custody 09/30/02 11:52 10/14/02 14:09 10/14/02 14:17  Lab ID: Received into CA	S-Rochester Custo  5886991  User gesmeria tmccarth tmccarth  588700  S-Rochester Custo	Dept Sample Management Metals Metals Matrix WATER	Storage Location Ambient 1 Ambient 1 LTS	Storage  Analysis  Storage	
Received into CA  Container:  Date of Custody 09/30/02 11:52 10/14/02 14:09 10/14/02 14:17  Lab ID: Received into CA  Container:	S-Rochester Custo  5886991  User gesmeria tmccarth tmccarth  588700  S-Rochester Custo  5887001	Dept Sample Management Metals Metals Matrix WATER ody: 9/28/02 10:30:0	Storage Location Ambient 1 Ambient 1 LTS	Storage Analysis Storage	
Received into CA  Container:  Date of Custody 09/30/02 11:52 10/14/02 14:09 10/14/02 14:17  Lab ID: Received into CA  Container: Date of Custody	S-Rochester Custo  5886991  User  gesmeria  tmccarth  tmccarth  588700  S-Rochester Custo  5887001  User	Dept Sample Management Metals Metals Matrix WATER Ody: 9/28/02 10:30:0	Storage Location Ambient 1 Ambient 1 LTS  Storage Location	Storage Analysis Storage	

Chain of	Custody					
Submission:	R2214005	Client:				
Lab ID:	588701	Matrix	WATER			
Received into CA	AS-Rochester Custo	ody: 9/28	3/02 10:30:00 A			***************************************
Container:	5887011					
Date of Custody	User	Dept		Storage Location	Purpose	Empty
09/30/02 11:52	gesmeria	Sample	Management	Ambient 1	Storage	
10/14/02 14:09	tmccarth	Metals	<del> </del>	Ambient 1	Analysis	
10/14/02 14:17	tmccarth	Metals		LTS	Storage	
Lab ID:	588702	Matrix	WATER			
Received into CA	\S-Rochester Custo	ody: 9/28	3/02 10:30:00 A			
Container:	5887021					
Date of Custody	User	Dept		Storage Location	Purpose	Empty
09/30/02 11:52	gesmeria	Sample	Management	Ambient 1	Storage	
10/14/02 14:09	trnccarth	Metals		Ambient 1	Analysis	
10/14/02 14:17	tmccarth	Metals		LTS	Storage	

Storage

## SAMPLE DATA

## METALS COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

ontract	R2214005				SDG No.	: GW03	01
ab Code	):	Case No.:			SAS No.	:	
OW No.	. SW846 CLP-M	Client:	Exponent	<u> </u>	<u> </u>	·	
	Sample No.		•	Lab Sample ID.			
	GW0301			588686			
	GW0302			588687			
	GW0303			588688			
	GW0304		·	588689			
	GW0305			588690			
	GW0306			588691			
	GW0307			588692	<del></del>		•
	GW0308			588693			
	GW0309			588694	<del></del>		
•	GW0310			588695	. <del></del>		
	GW0311			588696			1 .
	GW0312	·····		588697			•
	GW0313			588698			
	GW0313D			588698D			
	GW03135			5886988			
	GW0314	<del></del>		588699			
	GW0315			588700			•
	GW0316			588701	<del></del>		
	GW0317			588702	<del></del>		
Vere IC	P interelement correct:	ions applied	?		Yes/No	YES	
	P background correction yes-were raw data gene		•		Yes/No	YES	
	pplication of backgroun				Yes/No	NO	
:ommen	ts: See Attached Case N	Narrative				·	
:ontrac dove. :ompute	fy that this data packat, both technically and Release of the data correadable data submittager's designee, as ver	for completentained in the contained in	teness, f this hard tte has b	or other than the copy data package been authorized by	conditions and in the	detail	led
ignatur	e: Muchal K. f.		Name:	Michael Laboralo	K. Perr		
ite:	10/25/62		Title	: Laboral	N Mana	pr	<del>-00</del> 15

-1-

#### INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0301

_tract: R2214005

_ Code:

Case No.:

SAS No.:

SDG NO.: GW0301

⊸rix (soil/water): WATER

Lab Sample ID: 588686

wel (low/med):

LOW

Date Received: 09/28/02

Concentration Units (ug/L or mg/kg dry weight):  $\mu$ G/L

CAS No.	Analyte	Concentration	c	Q	М
7440-39-3	Barium	315			P
7440-50-8	Copper	20.0	ן ט		P
7439-89-6	Iron	7630	1	_	P
7439-92-1	Lead	5.0	ט		P
7439-96-5	Manganese	681			P
7440-02-0	Nickel	40.0	0		P
7440-62-2	Vanadium	62.9			P

_lor Before: YELLOW

Clarity Before:

CLEAR

Texture:

_lor After: COLORLESS

Clarity After:

CLEAR

Artifacts:

_mments:

-1-

#### **INORGANIC ANALYSIS DATA SHEET**

SAMPLE NO.

GW0302

ontract: R2214005

ib Code:

:vel (low/med):

Case No.:

LOW

SAS No.:

SDG NO.: GW0301

itrix (soil/water):

WATER

Lab Sample ID: 588687

Date Received: 09/28/02

Concentration Units (ug/L or mg/kg dry weight): μG/L

CAS No.	Analyte	Concentration	С	Q	М
7440-39-3	Barium	493			P
7440-50-8	Copper	20.0	[ ט		P
7439-89-6	Iron	18100	1		P
7439-92-1	Lead	5.0	ם		P
7439-96-5	Manganese	838			P
7440-02-0	Nickel	40.0	ט		P
7440-62-2	Vanadium	50.0	ש		P

olor Before: YELLOW

Clarity Before:

CLEAR

Texture:

olor After: COLORLESS

Clarity After:

CLEAR

Artifacts:

omments:

-1-

#### INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0303

-stract: R2214005

~ Code:

Case No.:

SAS No.:

SDG NO.:

GW0301

mrix (soil/water): WATER

Wel (low/med):

LOW

Lab Sample ID: 588688

Date Received: 09/28/02

Concentration Units (ug/L or mg/kg dry weight):  $\mu$ G/L

CAS No.	Analyte	Concentration	С	Q	M
7440-39-3	Barium	670			P
7440-50-8	Copper	20.0	ן ט		P
7439-89-6	Iron	20700			P
7439-92-1	Lead	5.0	ן ט		P
7439-96-5	Manganese	1040			P
7440-02-0	Nickel	40.0	ט		P
7440-62-2	Vanadium	50.0	ם		P

⊌lor Before: YELLOW

Clarity Before:

CLEAR

Texture:

-lor After: COLORLESS

Clarity After:

CLEAR

Artifacts:

-mments:

825840063

-1-

#### INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0304

ntract: R2214005

o Code:

Case No.:

SAS No.:

SDG NO.:

GW0301

trix (soil/water):

WATER

vel (low/med):

Lab Sample ID: 588689

Date Received: 09/28/02

Concentration Units (ug/L or mg/kg dry weight):

CAS No.	Analyte	Concentration	C	Ō	м
7440-39-3	Barium	1100			P
7440-50-8	Copper	20.0	ט		P
7439-89-6	Iron	17300			P
7439-92-1	Lead	5.0	ט		P
7439-96-5	Manganese	1200			P
7440-02-0	Nickel	40.0	ס		P
7440-62-2	Vanadium	50.0	ן ס		P

lor Before: YELLOW

Clarity Before:

CLEAR

Texture:

lor After: COLORLESS

Clarity After:

CLEAR

Artifacts:

mments:

-1-

#### INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0305

_.tract: R2214005

Case No.:

SAS No.:

SDG NO.:

GW0301

~rix (soil/water):

WATER

Lab Sample ID: 588690

wel (low/med):

_ Code:

LOW

Date Received: 09/28/02

Concentration Units (ug/L or mg/kg dry weight):  $\mu$ G/L

CAS No.	Analyte	Concentration	c	Q	М
7440-39-3	Barium	592	1 1	<u>-</u>	P
7440-50-8	Copper	20.0	ט		P
7439-89-6	Iron	19400	1 1	·	P
7439-92-1	Lead	5.0	u		P
7439-96-5	Manganese	1050			P
7440-02-0	Nickel	40.0	ט		P
7440-62-2	Vanadium	50.0	ן ט ן		P

→lor Before: YELLOW

Clarity Before:

CLEAR

Texture:

Jor After: COLORLESS

Clarity After:

CLEAR

Artifacts:

_mments:

-1-

#### INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0306

ntract: R2214005

b Code:

vel (low/med):

Case No.:

LOW

SAS No.:

SDG NO.:

GW0301

trix (soil/water):

WATER

Lab Sample ID: 588691

Date Received: 09/28/02

Concentration Units (ug/L or mg/kg dry weight):  $\mu$ G/L

CAS No.	Analyte	Concentration	c	Ω	м
7440-39-3	Barium	150			P
7440-50-8	Copper	20.0	ש		P
7439-89-6	Iron	15800			P
7439-92-1	Lead	5.0	ן ס	•	P
7439-96-5	Manganese	2820			P
7440-02-0	Nickel	40.0	ס		P
7440-62-2	Vanadium	50.0	ט		P

olor Before: YELLOW

Clarity Before:

CLEAR

Texture:

olor After: COLORLESS

Clarity After:

CLEAR

Artifacts:

mments:

-1-

#### INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

G	W	0	3	0	7	
_	••	•	~	•	•	

_itract: R2214005

Case No.:

SAS No.:

SDG NO.:

GW0301

*crix (soil/water):

Lab Sample ID: 588692

>vel (low/med):

پ Code:

Date Received: 09/28/02

Concentration Units (ug/L or mg/kg dry weight):  $\mu$ G/L

CAS No.	Analyte	Concentration	c	Q	М
7440-39-3	Barium	90.3			P
7440-50-8	Copper	20.0	ן ט		P
7439-89-6	Iron	100			P
7439-92-1	Lead	5.0	ס	•	P
7439-96-5	Manganese	182		-	P
7440-02-0	Nickel	40.0	ן ט		P
7440-62-2	Vanadium	50.0	0		P

→lor Before: YELLOW

Clarity Before:

CLEAR

Texture:

_lor After: COLORLESS

Clarity After:

CLEAR

Artifacts:

_mments:

-1-

#### **INORGANIC ANALYSIS DATA SHEET**

SAMPLE NO.

GW0308

ontract: R2214005

b Code:

Case No.:

SAS No.:

SDG NO.:

GW0301

WATER itrix (soil/water):

Lab Sample ID: 588693

Date Received: 09/28/02

:vel (low/med):

Concentration Units (ug/L or mg/kg dry weight):

CAS No.	Analyte	Concentration	C	Ö	M
7440-39-3	Barium	20.0	ט		P
7440-50-8	Copper	20.0	ש	i	P
7439-89-6	Iron	100	ש		P
7439-92-1	Lead	5.0	ס		P
7439-96-5	Manganese	10.0	ס		P
7440-02-0	Nickel	40.0	ס		P
7440-62-2	Vanadium	50.0			P

olor Before: YELLOW

Clarity Before:

CLEAR

Texture:

olor After: COLORLESS

Clarity After:

CLEAR

Artifacts:

omments:

-1-

#### INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0309

mcract: R2214005

rel (low/med):

~Code:

Case No.:

LOW

SAS No.:

SDG NO.: GW0301

Tix (soil/water): WATER

Lab Sample ID: <u>5</u>88694

Date Received: 09/28/02

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-39-3	Barium	300	$\Box$		P
7440-50-8	Copper	20.0	ן ס		P
7439-89-6	Iron	100	ט	-	P
7439-92-1	Lead	5.0	0	•	P
7439-96-5	Manganese	3690			P
7440-02-0	Nickel	40.0	ן ס		P
7440-62-2	Vanadium	50.0	0		P

wor Before: YELLOW

Clarity Before: CLEAR

Texture:

wor After: COLORLESS

Clarity After:

CLEAR

Artifacts:

mments:

-1-

#### INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0310

ntract: R2214005

b Code:

Case No.:

SAS No.:

SDG NO.:

GW0301

.trix (soil/water):

WATER

Lab Sample ID: 588695

Date Received: 09/28/02

:vel (low/med):

Concentration Units (ug/L or mg/kg dry weight): μG/L

CAS No.	Analyte	Concentration	C	Ğ	м
7440-39-3	Barium	194			P
7440-50-8	Copper	20.0	ס	1	P
7439-89-6	Iron	17300		1	P
7439-92-1	Lead	5.0	<b>U</b>		P
7439-96-5	Manganese	3730		1	P
7440-02-0	Nickel	40.0	U		₽
7440-62-2	Vanadium	50.0	ט	1	P

olor Before: YELLOW

Clarity Before:

CLEAR

Texture:

olor After: COLORLESS

Clarity After:

CLEAR

Artifacts:

omments:

-1-

#### INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0311

_cract: R2214005

vel (low/med):

_ Code:

Case No.:

SAS No.:

SDG NO.: GW0301

wix (soil/water):

LOW

WATER

Lab Sample ID: 588696

Date Received: 09/28/02

Concentration Units (ug/L or mg/kg dry weight):  $\mu$ G/L

CAS No.	Analyte	Concentration	c	Q	M
7440-39-3	Barium	363	1		P
7440-50-8	Copper	20.0	ט		P
7439-89-6	Iron	27100			P
7439-92-1	Lead	5.0	ן ט ן	•	P
7439-96-5	Manganese	861	<del>                                      </del>		P
7440-02-0	Nickel	40.0	0		P
7440-62-2	Vanadium	50.0	ס		P

∴or Before: YELLOW

Clarity Before:

CLEAR

Texture:

_or After: COLORLESS

Clarity After:

CLEAR

Artifacts:

_ments:

-1-

#### INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0312

ontract: R2214005

ab Code:

Case No.:

SAS No.:

SDG NO.:

GW0301

strix (soil/water):

WATER

Lab Sample ID: 588697

>vel (low/med):

LOW

Date Received: 09/28/02

Concentration Units (ug/L or mg/kg dry weight):

CAS No.	Analyte	Concentration	c	Q	м
7440-39-3	Barium	372			P
7440-50-8	Copper	20.0	ט		P
7439-89-6	Iron	27600			P
7439-92-1	Lead	5.0	ס		P
7439-96-5	Manganese	889	] ]		P
7440-02-0	Nickel	40.0	ן ס ן	<del></del>	P
7440-62-2	Vanadium	50.0	ט		P

!olor Before: YELLOW

Clarity Before:

CLEAR

Texture:

Color After: COLORLESS

Clarity After:

CLEAR

Artifacts:

:omments:

-1-

### **INORGANIC ANALYSIS DATA SHEET**

SAMPLE NO.

GW0313

_tract: R2214005

_ Code:

Case No.:

SAS No.:

SDG NO.: GW0301

_rix (soil/water): WATER

Lab Sample ID: 588698

_el (low/med):

Date Received: 09/28/02

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-39-3	Barium	395	H		P
7440-50-8	Copper	20.0	ם		P
7439-89-6	Iron	31700	1 1		P
7439-92-1	Lead	5.0	ט		P
7439-96-5	Manganese	4180		•	P
7440-02-0	Nickel	40.0	ס		P
7440-62-2	Vanadium	50.0	0		P

.or Before: YELLOW

Clarity Before: CLEAR

Texture:

or After: COLORLESS

Clarity After:

CLEAR

Form I - IN

Artifacts:

ments:

-1-

### INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0314

ntract: R2214005

b Code:

Case No.:

SAS No.:

SDG NO.: GW0301

trix (soil/water):

WATER

Lab Sample ID: 588699

vel (low/med):

LOW

Date Received: 09/28/02

Concentration Units (ug/L or mg/kg dry weight):  $\mu$ G/L

CAS No.	Analyte	Concentration	c	Q	M
7440-39-3	Barium	338	<del>                                     </del>		P
7440-50-8	Copper	20.0	ט		P
7439-89-6	Iron	2350	1	[	P
7439-92-1	Lead	5.0	<b>ט</b>		P
7439-96-5	Manganese	1380	1		P
7440-02-0	Nickel	40.0	ס		P
7440-62-2	Vanadium	50.0	ט	<del>                                     </del>	P

olor Before: YELLOW

Clarity Before:

CLEAR

Texture:

olor After: COLORLESS

Clarity After:

CLEAR

Artifacts:

omments:

-1-

### INORGANIC ANALYSIS DATA SHEET

		_		
c	AM)	אדר דר	NO	
-	MM.	-ub	NU	٠.

GW0315

_.tract: R2214005

Case No.:

SAS No.:

SDG NO.: GW0301

~rix (soil/water):

WATER

Lab Sample ID: 588700

-el (low/med):

_ Code:

LOW

Date Received: 09/28/02

Concentration Units (ug/L or mg/kg dry weight):

CAS No.	Analyte	Concentration	C	Q	м
7440-39-3	Barium	471		-	P
7440-50-8	Copper	20.0	0		P
7439-89-6	Iron	122	<del>                                      </del>		P
7439-92-1	Lead	5.0	U		P
7439-96-5	Manganese	366	<del>                                      </del>		P
7440-02-0	Nickel	40.0	U		P
7440-62-2	Vanadium	50.0	ן ס		P

_lor Before: YELLOW

Clarity Before:

CLEAR

Texture:

_lor After: COLORLESS

Clarity After:

CLEAR

Artifacts:

_mments:

-1-

### **INORGANIC ANALYSIS DATA SHEET**

SAMPLE NO.

GW0316

ntract: R2214005

b Code:

vel (low/med):

Case No.:

SAS No.:

SDG NO.:

GW0301

trix (soil/water):

LOW

WATER

Lab Sample ID: 588701

Date Received: 09/28/02

Concentration Units (ug/L or mg/kg dry weight): μG/L

CAS No.	Analyte	Concentration	c	Q	M
7440-39-3	Barium	20.0	U		P
7440-50-8	Copper	20.0	U		P
7439-89-6	Iron	387			P
7439-92-1	Lead	5.0	ט		P
7439-96-5	Manganese	10.0	0		P
7440-02-0	Nickel	40.0	0		P
7440-62-2	Vanadium	50.0	0		P

plor Before: YELLOW

Clarity Before:

CLEAR

Texture:

olor After: COLORLESS

Clarity After:

CLEAR

Artifacts:

mments:

-1-

### INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0317

_tract: R2214005

Case No.:

SAS No.:

SDG NO.:

GW0301

~rix (soil/water):

WATER

Lab Sample ID: 588702

vel (low/med):

_ Code:

Date Received: 09/28/02

Concentration Units (ug/L or mg/kg dry weight):

CAS No.	Analyte	Concentration	c	Q	м
7440-39-3	Barium	75.4			P
7440-50-8	Copper	20.0	ט		P
7439-89-6	Iron	5110			P
7439-92-1	Lead	5.0	0		P
7439-96-5	Manganese	1500	<u> </u>		P
7440-02-0	Nickel	40.0	ס		P
7440-62-2	Vanadium	50.0	0	_	P

_lor Before: YELLOW

Clarity Before:

CLEAR

Texture:

_lor After: COLORLESS

Clarity After:

CLEAR

Artifacts:

_mments:

### -2A-

### INITIAL AND CONTINUING CALIBRATION VERIFICATION

ontract: R2214005

ib Code:

Case No.:

SAS No.:

SDG NO.: GW0301

nitial Calibration Source: PE PURE

ontinuing Calibration Source: PE PURE

Concentration Units: ug/L

	Initial Calibration			Continuing Calibration						
Analyte	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	M	
Barium	10000.0	10171.34	101.7	10000.0	10113.63	101.1	10278.5	4 102.8	P	
Copper	1250.0	1229.23	98.3	1250.0	1243.28	99.5	1239.9	9 99.2	P	
Iron	5000.0	4907.94	98.2	5000.0	4979.40	99.6	4968.1	5 99.4	P	
Lead	500.0	495.96	99.2	500.0	499.06	99.8	499.7	6 100.0	P	
Manganese	750.0	756.50	100.9	750.0	754.92	100.7	773.1	3   103.1	P	
Nickel	2000.0	1996.94	99.8	2000.0	2012.47	100.6	2018.7	9 100.9	P	
Vanadium	2500.0	2443.94	97.8	2500.0	2463.81	98.6	2468.1	7 98.7	P	

⁽¹⁾ Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

### -2A-

### INITIAL AND CONTINUING CALIBRATION VERIFICATION

_tract: R2214005

Code:

Case No.:

SAS No.:

SDG NO.: GW0301

_cial Calibration Source:

...tinuing Calibration Source: PE PURE

### Concentration Units: ug/L

	Initial	Calibration	a	Conti	Continuing Calibration				1
Analyte	True	Found	%R(1)	True	Found	%R (1/)	Found	8R (1)	M
Barium			1	10000.0	10308.61	103.1	10085.29	100.9	P
Copper			l l	1250.0	1243.37	99.5	1253.61	100.3	P
Iron	•			5000.0	4990.33	99.8	4937.86	98.8	P
Lead				500.0	499.07	99.8	497.12	99.4	P
Manganese	i			750.0	766.74	102.2	751.86	100.2	P
Nickel				2000.0	2028.45	101.4	2005.06	100.3	P
Vanadium			1	2500.0	2478.56	99.1	2463.02	98.5	P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

### -2A-

### INITIAL AND CONTINUING CALIBRATION VERIFICATION

ntract: R2214005

b Code:

Case No.:

SAS No.:

SDG NO.: GW0301

itial Calibration Source:

ntinuing Calibration Source: PE PURE

Concentration Units: ug/L

	Initial Calibration		Contin					
Analyte	True	Found %R(1)	True	Found	%R (1)	Found	%R(1)/	M
Copper	<u>.</u>		1250.0	1238.06	99.0	1245.28	99.6	P
Iron	1		5000.0	4961.25	99.2	4988.86	99.8	P
Lead	1.		500.0	497.59	99.5	503.31	100.7	P
Nickel	1		2000.0	2011.47	100.6	2026.92	101.3	P
Vanadium	T		2500.0	2460.86	98.4	2481.66	99.3	P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

### -2A-

### INITIAL AND CONTINUING CALIBRATION VERIFICATION

_cract: R2214005

_ Code:

Case No.:

SAS No.:

SDG NO.: GW0301

wial Calibration Source:

ntinuing Calibration Source: PE PURE

### Concentration Units: ug/L

	Initial Calibration		Contin	ı				
Analyte	True	Found %R(1)	True	Found	%R(1)	Found	%R(1)	M
Copper			1250.0	1246.23	99.7	1262.2	5 101.0	P
Iron	1		5000.0	4991.20	99.8	4988.7	5 99.8	P
Lead	1		500.0	501.25	100.3	502.9	3 100.6	P
Nickel	1		2000.0	2020.14	101.0	2037.7	3 101.9	P
Vanadium	1		2500.0	2479.30	99.2	2502.5	7 100.1	P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

### -2A-

### INITIAL AND CONTINUING CALIBRATION VERIFICATION

ntract: R2214005

b Code:

Case No.:

SAS No.:

SDG NO.: GW0301

itial Calibration Source:

ntinuing Calibration Source: PE PURE

Concentration Units: ug/L

	Initial	Calibration	Continuing Calibration					
Analyte	True	Found %R(1)	True	Found	%R(1)	Found	%R(1)	M
Copper	1 1		1250.0	1274.22	101.9	/1271.4	1 101.7	P
Iron	1		5000.0	5031.45	100.6/	5360.8	7 707.2	P
Lead	1.		500.0	499.75	99/9	505.7	5 101.2	P
Nickel	1		2000.0	2056.28	102.8	2045.4	3 102.3	₽
Vanadium	ī		2500.0	2525.77	101.0	2510.1	5 100.4	P

⁽¹⁾ Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

### METALS -2B-

### CRDL STANDARD FOR AA AND ICP

tract: R2214005

Code:

Case No.:

SAS No.:

SDG No.: GW0301

RDL Standard Source:

CRDL Standard Source:

CPI

### Concentration Units: ug/L

	CRDL Standard for AA			CRDL Standard for ICP							
		diddid ioi im		Init	tial		Final				
Analyte	True	Found %R		True	Found	%R	Found	%R			
Barium				200.0	202.37	101.2	206.52	103.3			
Copper	J			25.0	25.23	100.9	22.70	90.8			
Iron				100.0	80.92	80.9	113.96	114.0			
Lead				10.0	9.01	90.1	9.96	99.6			
Manganese	<u> </u>			15.0	15.62	104.1	16.03	106.9			
Nickel			1	40.0	42.06	105.2	41.35	103.4			
Vanadium				50.0	49.05	98.1	48.49	97.0			

-3-

**BLANKS** 

ntract: R2214005

o Code:

Case No.:

SAS No.:

SDG NO.: GW0301

sparation Blank Matrix (soil/water): WATER

eparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	2	1	ر د د	Continuing Blank 2	(ug		ration 3	c/	Preparation Blank	c	M
Barium	20.0	ט	20	.06	20	.o¥	θI	20.0	Ū	20.000	ט	P
Copper	20.0	۵	20	. 0   <del>U</del>	20	.0	ש	20.0	ט	20.000	ט	P
Iron	100.0	ם	100	. 0   <del>U</del>	100	. 0	ַ ע	100.0	ש	100.000	ש	P
Lead	5.0	ס	5	ت   0∙.	5	.0	ש[_	5.0	ש	5.000	ט	P
Manganese	10.0	Ū	10	. 0   U	10	.0	וס	10.0	ט	10.000	ט '	P
Nickel	40.0	ַ	40	. ס  ס	40	.0	ן ט	40.0	ט	40.000	ם	P
Vanadium	50.0	ט	50	. 0   <del>U</del>	50	.0	שׁ	50.0	ש	50.000	ש	P

-3-

**BLANKS** 

mtract: R2214005

- Code:

Case No.:

SAS No.:

SDG NO.: GW0301

eparation Blank Matrix (soil/water): WATER

eparation Blank Concentration Units (ug/L or mg/kg): UG/L

	Initial Calib Blank	alib. Continuing Calibr							Preparation Blank		
Analyte	(ug/L)	c	1	C	2 /	C	3	/c		С	M
Barium		1.1.	20.	ا و اد	· · · · · · · · · · · · · · · · · · ·						P
Copper		1 1	20.0	ם וכ	20.0	ס	20.0	ש			P
Iron		l l	100.0	ַ   פ	100.0	וס	100.0	<b>ט</b>			P
Lead	1		5.0	) <del> </del>	5.0	미	5.0	Ū			P
Manganese		ĹĹ	10.0	ן ס (כ							P
Nickel		ΙĪ	40.0	<del> </del>	40.0	ט	40.0	ט			P
Vanadium		Ì	50.0	0	50.0	ט	50.0	ט			P

-3-

**BLANKS** 

ntract: R2214005

b Code:

Case No.:

SAS No.:

SDG NO.: GW0301

eparation Blank Matrix (soil/water): WATER

eparation Blank Concentration Units (ug/L or mg/kg): UG/L

	Initial Calib. Blank			Con	ntinuing Ca Blank (uc		ration		Preparation Blank			
Analyte	(ug/L)	c	1	/c	2	<b>c</b> /	3	9/	1	С	1	M
Copper	1		20.0	<u>ס</u>	20.0	ט	20.0	<u>ס</u>		l		P
Iron	1		100.0	ס	100.0	ס	100.0	ַ				P
Lead	1		5.0	ַ	5.0	ס	5.0	ט				P
Nickel	1		40.0	ט	40.0	ט	40.0	ט				P
Vanadium	1		50.0	וט	50.0	וס	50.0	ס				P

-3-

**BLANKS** 

reract: R2214005

- Code:

Case No.:

SAS No.:

SDG NO.: GW0301

paration Blank Matrix (soil/water): WATER

paration Blank Concentration Units (ug/L or mg/kg): UG/L

	Initial Calib. Blank			Con	tinuing Blank		ration		Preparation Blank		
Analyte	(ug/L)	С	<b>/i</b>	C	2	C	3	c		c	M
Copper		<u> </u>	20.0	ט	-						P
Iron	1		100.0	ט		$\perp$ $\perp$					P
Lead	1'		5.0	ט							P
Nickel	1		40.0	<b>ט</b>						l l	P
Vanadium	Ī		50.0	וט		1 1		1 1		I T	P

# -4ICP INTERFERENCE CHECK SAMPLE

ntract: R2214005

b Code:

Case No.:

SAS No.:

SDG NO.: GW0301

P ID Number:

Optima ICP

ICS Source:

PE PURE

Concentration Units): Ug/L

	Tru	e	Initi	al Found		Final	Found	
Analyte	Sol.A	Sol.AB	Sol.A	Sol.AB	<b>∕</b> &R	Sol.A	Sol.AB	/8R
Barium		500	4	537.5	107.5	4	530.5	106.1
Manganese		500	1	496.3	99.3	1	488.1	97.6

## ICP INTERFERENCE CHECK SAMPLE

wcract: R2214005

- Code:

Case No.:

SAS No.:

SDG NO.: GW0301

- ID Number:

Optima ICP 2

ICS Source:

PE PURE

Concentration Units): ug/L

	True		Initi	al Found	ļ	Final		
Analyte	Sol.A	Sol.AB	Sol.A	Sol.AB	%R	Sol.A	Sol.AB	%R
Copper	.1	500	-1	529.6	105.9	-2	534.7	106.9
Iron	200000	200000	187726	188268.0	94.1	188192	189176.9	94.6
Lead		50	0	48.7	97.4	0	48.5	97.0
Nickel		1000	0	929.1	92.9	1	940.4	94.0
Vanadium		500	-2	505.5	101.1	-2	507.1	101.4

### -5A-

### SPIKE SAMPLE RECOVERY

SAMPLE NO.

GW03138	
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ntract: R2214005

.b Code:

Case No.:

SAS No.:

SDG NO.: GW0301

trix (soil/water): WATER

Level (low/med):

LOW

Solids for Sample: 0.0

Concentration Units (ug/L or mg/kg dry weight):  $\mu$ G/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	С	Sample Result (SR) C	Spike Added (SA)	%R,	м
Barium	75 - 125	2515.8301	$\top$	394.8679	2000.00	106.0	P
Copper	75 - 125	281.7583		20.0000 0	250.00	112.7	P
Iron	1	33285.9570	$\overline{}$	31743.0508	1000-00	154.3	P
Lead	75 - 125	495.5022	T	50000 U	500.00	99.1	P
Manganese	Ι	4792.4155		(4177.2720	500.00	123.0	P
Nickel	75 - 125	521.7316	Ī	40.0000 U	500.00	104.3	P
Vanadium	75 - 125	539.5754	T	50.0000 U	500.00	107.9	P

OK

æL

mments:

-5B-

### POST DIGEST SPIKE SAMPLE RECOVERY

SAMPLE NO.
------------

tract: R2214005

GW0313A

Code:

Case No.:

SAS No.:

SDG NO.: GW0301

ix (soil/water): WATER .

Level (low/med):

LOW

### Concentration Units: ug/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	Sample Result (SR)	c,	Spike Added(SA)	₹R	Q	·M
Barium	1	1946.68	394.87		2000.0	77.6		P
Copper	1.	268.43	20.00	וט	250.0	107.4		₽
Iron	1	31912.08	31743.05		1000.0	16.9		P
Lead	1	468.63	5.00	ט	500.0	93.7	_	<b>1</b> /P
Manganese	1	4678.69	4177.27		500.0	100.3	V	P
Nickel	1	491.65	40.00	ט	500.0	98.3		P
Vanadium	I	508.88	50.00	ן ט	500.0	101.8		P

-6-

### **DUPLICATES**

SAMPLE NO.

GW0313D

mtract: R2214005

Solids for Sample:

ib Code:

Case No.:

SAS No.:

SDG NO.: GW0301

trix (soil/water): WATER

Level (low/med):

LOW

% Solids for Duplicate:

Analyte	Control	Sample (S)	С	Duplicate (D)	С	RPD	Q	×
Barium		394.8679	Ϊ	413.0077	Π	4.5	i	P
Copper	1	20.0000	ם	20.0000	ס	İ		P
Iron	1	31743.0508	Ì	32790.2852		3.2		₽
Lead	1	5.0000	<b>ט</b>	5.0000	<u>ס</u>		Ì	₽
Manganese	1	4177.2720		4373.5381		4.6		P
Nickel	1	40.0000	ט	40.0000	ש			P
Vanadium	1 11	50.0000	<u>ס</u>	50.0000	ט	1/	ı	P

-7-

### LABORATORY CONTROL SAMPLE

_ract: R2214005

_ lode:

Case No.:

SAS No.:

SDG NO.: GW0301

_d LCS Source:

⊷ous LCS Source: CPI

l	Aqueou	s (ug/L)			Solid (mg/kg)						
Analyte	True	Found	%R	True	Found	C	Limits	%R			
Barium	2000.0	2111.22	105.6		1	1					
Copper	250.0	276.19	110.5			1					
Iron	1000.0	1051.42	105.1	*		1					
Lead	500.0	533.32	106.7		1						
Manganese	500.0	518.75	103.8			1.					
Nickel	500.0	543.20	108.6	-		Ti					
Vanadium	500.0	518.23	103.6			7 ]		1			



### A FULL SERVICE ENVIRONMENTAL LABORATORY

November 16, 2002

NOV 2 7 2002

Mr. Dave Lamadrid Exponent 4000 Kruseway Place Bldg 2, Suite 285 Lake Oswego, OR 97035

PROJECT: WOOD-RIDGE, NJ Submission #:R2214196

Dear Mr. Lamadrid

Enclosed are the analytical results of the analyses requested. All data has been reviewed prior to report submission. Should you have any questions please contact me at (585) 288-5380.

Thank you for letting us provide this service.

Sincerely,

COLUMBIA ANALYTICAL SERVICES

Michael Perry

Laboratory Director

Enc.



1 Mustard ST. Suite 250 Rochester, NY 14609 (585) 288-5380

### THIS IS AN ANALYTICAL TEST REPORT FOR:

Client : Exponent

Project Reference: WOOD-RIDGE, NJ

Lab Submission # : R2214196

Project Manager : Michael Perry

Reported : 11/16/02

Report Contains a total of 173 pages

The results reported herein relate only to the samples received by the laboratory. This report may not be reproduced except in full, without the approval of Columbia Analytical Services.

This package has been reviewed by Columbia Analytical Services' QA
Department/Laboratory Director to comply with NELAC standards prior
to report submittal.

# **SDG NARRATIVE**

### **CASE NARRATIVE**

COMPANY: Exponent Project: Wood-Ridge, NJ SDG#: 0930W SUBMISSION #: R2214196

Exponent samples were collected the week of 10/07/02 and received at CAS in good condition 10/11/02 at a temperature of 3 ° C. See CAS CLP Batching sheets for a cross-reference between Client ID and CAS Job # and analyses requested.

### **METALS ANALYSIS**

Fourteen soil samples and one water sample were analyzed for Mercury using SW-846 methods 7470/7471.

The initial and continuing calibration criteria were met for all analytes.

The matrix spike and duplicate analysis were performed on samples SP0001 and SP0016. The blank spike recoveries (LCS) were all within QC limits of 80 – 120 %. All Matrix Spike Recoveries were within QC limits of 75 – 125 %. The matrix spike recovery for sample SP0001 could not be accurately calculated due to the amount of analyte detected in the sample versus the spike amount added. The % RPD's from the duplicate analyses were all within QC limit.

No other analytical or QC problems were encountered.

BATCH COMPLETE: _yes____ DATE REVISED: SDG #:SP0002 DISKETTE REQUESTED: Y___ N__x_ DATE DUE: 11/08/02 SUBMISSION R2214196 PROTOCOL: NJ Reduced CLIENT: Exponent DATE: 10/14/02 SHIPPING No.: CLIENT REP: Michael Perry CUSTODY SEAL: PRESENT SUMMARY PKG: Y____ N___X_ PROJECT: WOODRIDGE, NJ CHAIN OF CUSTODY: PRESENT REMARKS REQUESTED PARAMETERS DATE PH CAS JOB # CLIENT/EPA ID MATRIX DATE SAMPLED RECEIVED (SOLIDS | SOLIDS SAMPLE CONDITION 10/8/02 10/11/02 592437 SP0001 SOIL HG + QC 10/8/02 10/11/02 592438 SP0002 SOIL HG 592439 SOIL HG 10/8/02 10/11/02 SP0003 592440 SOIL 10/8/02 10/11/02 SP0004 HG SOIL 10/9/02 10/11/02 592441 SP0005 HG HG 10/9/02 10/11/02 592442 SP0006 SOIL SP0007 SOIL HG 10/9/02 10/11/02 592443 10/9/02 10/11/02 SOIL HG 592444 SP0013 592445 SP0014 SOIL HG 10/9/02 10/11/02 10/9/02 10/11/02 592446 SOIL HG SP0015 592450 SP0018 SOIL HG 10/10/02 10/11/02 592453 SP0019 SOIL HG 10/10/02 10/11/02 HG 592458 GW0318 WATER 10/9/02 10/11/02 599140 SP0016 SOIL HG + OC 10/9/02 10/11/02 10/10/02 10/11/02 599141 SP0020 SOIL HG







Effective 11/4/2002

### **INORGANIC QUALIFIERS**

### C (Concentration) qualifier -

- B if the reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but was greater than or equal to the Instrument Detection Limit (IDL).
- U if the analyte was analyzed for, but not detected

### Q qualifier - Specified entries and their meanings are as follows:

- D Spike was diluted out
- E The reported value is estimated because of the presence of interference.
- J Estimated Value
- M Duplicate injection precision not met.
- N Spiked sample recovery not within control limits.
- S The reported value was determined by the Method of Standard Additions (MSA).
- W Post-digestion spike for Furnace AA Analysis is out of control limits (85-115), while sample absorbance is less than 50% of spike absorbance.
- * Duplicate analysis not within control limits.
- +- Correlation coefficient for the MSA is less than 0.995.

### M (Method) qualifier:

- "P" for ICP
- "A" for Flame AA
- "F" for Furnace AA
- "PM" for ICP when Microwave Digestion is used
- "AM" for Flame AA when Microwave Digestion is used
- "FM" for Furnace M when Microwave Digestion is used
- "CV" for Manual Cold Vapor AA
- "AV" for Automated Cold Vapor AA
- "CA" for Midi-Distillation Spectrophotometric
- "AS" for Semi-Automated Spectrophotometric
- "C" for Manual Spectrophotometric
- "T" for Titrimetric
- " " where no data has been entered
- "NR" if the analyte is not required to be analyzed.

### CAS/Rochester Lab ID # for State Certifications

Army Corp of Engineers Validated
Delaware Accredited
Connecticut ID # PH0556
Florida ID # E87674
Massachusetts ID # M-NY032
Navy Facilities Engineering Service Center Approved
Nebraska Accredited
H:\GROUP\FORMS\QUALIF_I.DOC

NELAP Accredited New York ID # 10145 New Jersey ID # NY004 New Hampshire ID # 294100 A/B Rhode Island ID # 158 South Carolina ID #91012 West Virginia ID # 292

# CHAINS OF CUSTODY INTERNAL CHAINS

CHAIN OF CUSTODY RECORD/SAMPLE ANALYSIS REQUEST FORM

Office: 40

Matrix

SL

Samplers:

Total Mercury

747

EPA

Project: (Name and Number) Ventron/Velsicol w Wood-Ridge

Date

10/8/02/0945

Time

0950

0955

1000

10/9/02 0945 6W

1443

1450

1453

1440 56

Exponent Contact: David Lamadr, d

Sample No.

510001

SC 0002

SP 0003

580004

6W0318

51,0005

510006

SP0007

510008

Ship to: Columbia Analytical Services

Rochester, NY 14609

Tag No.

27086

27087

27088

27089

27090

27091

27092

27073

27094

1 Mustard street ste. 250

Lab Contact/Phone: Milte Perry (585) 288-8475

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Distribution: White and Yellow Copies - Accompany Shipment; Pink Copy - Project File 

8600B3N.005 040Z

**Analyses Requested** 

RZZ-14196

Extra Container

Page _/_ of _<

 $\mathbf{E}^{\mathbf{x}}$ ponent

Bellevue, WA

Boston, MA

Boulder, CO

(425) 643-9803

(781) 466-6681

(303) 444-7270 Portland, OR

(503) 636-4338 Washington, D.C.

(301) 577-7830

Remarks

Project: (Name and Number)	ventron/	velsi	col W	ood-	Ridge			l	RZZI	14196			$\mathbf{E}^{\mathbf{x}}$ ponent
Exponent Contact:	David Lan	madri.	<u>ا</u> Offi	ce: <u>L0</u>	Samplers:	lail	XR4						Bellevije WA
Ship to: Columb	zia Analy 1	tical S	orvice	<u> </u>			Analyses R			<del></del>			Boston, MA
Ship to: Columbia Roches Lab Contact/Phone:	tand Stiee Ster, NY Mike Penry	1, svi 1460 (585)	1c 25 9 288-2	3475		Total Merculy ECA 7471					Extra Container	Archive	(781) 466-6681 <b>Boulder, CO</b> (303) 444-7270 <b>Portland, OR</b> (503) 636-4338 <b>Washington, D.C.</b> (301) 577-7830
Sample No.	Tag No.	Date	Time	Matrix		Total ECA					Ä	Ā	Remarks
510018	37757	Iolioloz	1040	SL		X							
50019	37758		1055			X							
SF0020	37759		1057									X	Mease
50021	37760		1115				į					X	
5100ZZ	37761	1	1117									X	
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		1			<u>l</u>	ļ	<u> </u>	<u> </u>				<u> </u>	
	lwater SL - Soi		ediment	SW - Sur	face water	Priority:	Normal	Rust	n Rush ti	me period			
Shipped X FedE	x/UPS 🔲 Cou	rier Other				Condition of Upon Rece	of Samples feipt:	ntact		Cu	istody Se	al Intact	Yes No No
telį̇̃nquished by:	Dail Z.		1	Da	ite/Time: 10	-10-02/17	00 Received	i by:	y Ola	rlim			Date/Time: 10-11-02 10
•	(Sic	nature)						777	0	Signature)			-

## Cooler Receipt And Preservation Check Form

Project/ClientE	exponent	. <u></u>		Submission Nun	ober <u>R2-141</u>	96.	
Cooler received on	0-11-03 by:_	HE	_COU	RIER: CAS	UPS FEDE	CD&L (	CLIENT
<ol> <li>Were custod</li> <li>Did all bottle</li> <li>Did any VO</li> <li>Were Ice or</li> <li>Where did the</li> </ol>	ly seals on outside ly papers properly es arrive in good of A vials have signi lce packs present he bottles originate e of cooler(s) upon	filled of condition ficant and and and and and and and and and and	out (inl on (unt air bub	roken)?	YES YES YES YES CAS/	NO NO NO NO NO ROO CLIEN	IA) IT
ls the temper	rature within 0° - (	6° C?:		Yes Yes	Yes	Yes	Yes
lf No, Expla	in Below			No No	No	No	No
Date/Time T	emperatures Take	:n:	0-11-	-02 @ 10	135		
Thermomete	er ID: 161 or (	IR GI		Reading From:	Temp Blank	or Sample	Bottle
If out of Temperate	ure, Client Appr	oval to	Run S	Samples			
3. Were correct	e labels and tags and	or the t	ests in	dicated?	rized Tedlar	NO NO ® Bags Inflate	d N/A
		YES	NO	Sample I.D.	Reagent	Vol. Add	led
рН	Reagent						
12	NaOH				•		
2	HNO ₃						
2	H₂SO₄	-					
Residual Chlorine (+/-)	for TCN & Phenol	-	<u> </u>				
5-9**	P/PCBs (608 only)	<u> </u>					
YES = All samples OK **If pH adjustment is requ			e preser	ved at lab as listed	PC OK to adj	ust pH	
	C Vial pH Verification	1					
	Fested after Analysis) Following Samples Exhibited pH > 2						

Submission:	R2214196	Client: Exponent			
Lab ID:	592437	Matrix SOIL			
Received into C	AS-Rochester Custo	ody: 10/11/02 10:30:00		~~~	***********************
Container:	5924371				
Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:20	kcook	Sample Management	Cooler 3	Storage	
10/28/02 13:01	dbond	Metals	Cooler 3	Analysis	
10/28/02 15:15	dbond	Metals	Cooler 3	Storage	
Container:	5924372			***************************************	****************
Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:18	kcook	Sample Management	Cooler 2	Storage	
10/18/02 11:55	gnita-jo	Wet Chemistry	Cooler 2	Analysis	
10/18/02 16:23	gnita-jo	Wet Chemistry	Cooler 2	Storage	
Lab ID:	592438	Matrix SOIL			
Received into C	AS-Rochester Custo	ody: 10/11/02 10:30:00	······	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	***************************************
Container:	5924381				
Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:20	kcook	Sample Management	Cooler 3	Storage	
10/28/02 13:01	dbond	Metals	Cooler 3	Analysis	
10/20/02 13.01			Cooler 3	Storage	
10/28/02 15:15	dbond	Metals	Cooler 3		
	dbond 5924382	Metals	Cooler 3		***************************************
10/28/02 15:15		Metals Dept	Storage Location	Purpose	Empty
10/28/02 15:15  Container:  Date of Custody	5924382				Empty
10/28/02 15:15  Container:	5924382 User	Dept	Storage Location	Purpose	Empty

#### Chain of Custody R2214196 Client: **Exponent** Submission: 592439 Matrix SOIL Lab ID: 10/11/02 10:30:00 Received into CAS-Rochester Custody: Container: 5924391 Date of Custody User Dept Storage Location Purpose **Empty** Cooler 3 10/11/02 16:20 kcook Sample Management Storage 10/28/02 13:01 Cooler 3 dbond Metals Analysis 10/28/02 15:15 Cooler 3 dbond Metals Storage 5924392 Container: Date of Custody Storage Location User Dept Purpose **Empty** 10/11/02 16:18 kcook Sample Management Cooler 2 Storage 10/18/02 11:55 gnita-jo Wet Chemistry Cooler 2 Analysis 10/18/02 16:23 Wet Chemistry Cooler 2 gnita-jo Storage 592440 SOIL Lab ID: Matrix Received into CAS-Rochester Custody: 10/11/02 10:30:00 5924401 Container: Date of Custody Dept Storage Location **Empty** User Purpose 10/11/02 16:20 kcook Sample Management Cooler 3 Storage 10/28/02 13:01 dbond Metals Cooler 3 Analysis

Metals

Dept

Sample Management

Wet Chemistry

Wet Chemistry

Cooler 3

Cooler 2

Cooler 2

Cooler 2

Storage Location

10/28/02 15:15

Container:

Date of Custody

10/11/02 16:18

10/18/02 11:55

10/18/02 16:23

dbond

5924402

User

kcook

gnita-jo

gnita-jo

**Empty** 

Storage

Purpose

Storage

Analysis

Storage

Chain of	Custody				
Submission:	R2214196	Client: Exponent			
Lab ID:	592441	Matrix SOIL			
Received into Ca	AS-Rochester Cus	tody: 10/11/02 10:30:00			
Container:	5924411			***************************************	
Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:20	kcook	Sample Management	Cooler 3	Storage	
10/28/02 13:01	dbond	Metals	Cooler 3	Analysis	
10/28/02 15:15	dbond	Metals	Cooler 3	Storage	
Container:	5924412	······································	***************************************	***************************************	***************************************
Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:18	kcook	Sample Management	Cooler 2	Storage	
10/18/02 11:55	gnita-jo	Wet Chemistry	Cooler 2	Analysis	
10/18/02 16:23	gnita-jo	Wet Chemistry	Cooler 2	Storage	
Lab ID:	500440	Matrix SOIL			
Luo ID.	592442	Matrix SOIL			
	592442 AS-Rochester Cus				
					.00000000000000000000000000000000000000
Received into Ca	AS-Rochester Cus		Storage Location	Purpose	Empty
Received into Container:	AS-Rochester Cus	tody: 10/11/02 10:30:00	Storage Location Cooler 3	Purpose Storage	Empty
Received into Container:  Date of Custody	AS-Rochester Cus 5924421 User	tody: 10/11/02 10:30:00  Dept			
Received into Container:  Date of Custody  10/11/02 16:20	AS-Rochester Cus 5924421 User kcook	Dept Sample Management	Cooler 3	Storage	
Received into C.  Container:  Date of Custody  10/11/02 16:20  10/28/02 13:01	AS-Rochester Cus  5924421  User  kcook  dbond	Dept Sample Management Metals	Cooler 3	Storage Analysis	
Received into C.  Container:  Date of Custody 10/11/02 16:20 10/28/02 13:01 10/28/02 15:15	AS-Rochester Cus  5924421  User  kcook  dbond  dbond	Dept Sample Management Metals	Cooler 3	Storage Analysis	
Received into C.  Container:  Date of Custody  10/11/02 16:20  10/28/02 13:01  10/28/02 15:15  Container:	AS-Rochester Cus  5924421  User kcook dbond dbond  5924422	Dept Sample Management Metals Metals	Cooler 3 Cooler 3	Storage Analysis Storage	
Received into C.  Container:  Date of Custody  10/11/02 16:20  10/28/02 13:01  10/28/02 15:15  Container:  Date of Custody	AS-Rochester Cus  5924421  User  kcook  dbond  dbond  5924422  User	Dept Sample Management Metals Dept	Cooler 3 Cooler 3 Cooler 3 Storage Location	Storage Analysis Storage Purpose	Empty

# Chain of Custody

Submission:	R2214196	Client: Expone	nt		
Lab ID:	592443	Matrix SOIL			
Received into C	AS-Rochester Cus	stody: 10/11/02 10:30:0	00	~~~	>>>
Container:	5924431				
Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:20	kcook	Sample Management	Cooler 3	Storage	
10/28/02 13:01	dbond	Metals	Cooler 3	Analysis	
10/28/02 15:15	dbond	Metals	Cooler 3	Storage	
Container:	5924432				***************************************
Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:18	kcook	Sample Management	Cooler 2	Storage	
10/18/02 11:55	gnita-jo	Wet Chemistry	Cooler 2	Analysis	
10/18/02 16:23	gnita-jo	Wet Chemistry	Cooler 2	Storage	
Lab ID: Received into C	592444 AS-Rochester Cus	<i>Matrix</i> SOIL tody: 10/11/02 10:30:0	0		
Container:	5924441				
Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:18	kcook	Sample Management	Cooler 2	Storage	
10/18/02 11:55	gnita-jo	Wet Chemistry	Cooler 2	Analysis	
10/18/02 16:23	gnita-jo	Wet Chemistry	Cooler 2	Storage	
Container:	5924442				
Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:20	kcook	Sample Management	Cooler 3	Storage	
10/28/02 13:01	dbond	Metals	Cooler 3	Analysis	
10/28/02 15:16	dbond	Metals	Cooler 3	Storage	

Chain of	Custody				
Submission:	R2214196	Client: Exponent			
Lab ID:	592445	Matrix SOIL			
Received into Ca	AS-Rochester Cus	tody: 10/11/02 10:30:00			*************************************
Container:	5924451				
Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:20	kcook	Sample Management	Cooler 3	Storage	
10/28/02 13:01	dbond	Metals	Cooler 3	Analysis	
10/28/02 15:16	dbond	Metals	Cooler 3	Storage	
Container:	5924452				
Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:18	kcook	Sample Management	Cooler 2	Storage	
10/18/02 11:55	gnita-jo	Wet Chemistry	Cooler 2	Analysis	
10/18/02 16:23	gnita-jo	Wet Chemistry	Cooler 2	Storage	
Lab ID:	592446 AS-Rochester Cus	<i>Matrix</i> SOIL			
Container:	5924461				***************************************
Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:20	kcook	Sample Management	Cooler 3	Storage	
10/28/02 13:01	dbond	Metals	Cooler 3	Analysis	
10/28/02 15:16	dbond	Metals	Cooler 3	Storage	
Container:	5924462			***************************************	
Date of Custody	User	Dept	Storage Location	Purpose	Empty
10/11/02 16:18	kcook	Sample Management	Cooler 2	Storage	
10/18/02 11:55	gnita-jo	Wet Chemistry	Cooler 2	Analysis	
10/18/02 16:23	gnita-jo	Wet Chemistry	Cooler 2	Storage	

Chain of	Custody					
Submission:	R2214196	Client:	Exponent			
Lab ID:	592450	Matrix	SOIL			
Received into CA	AS-Rochester Cus	tody: 10/1	1/02 10:30:00	***************************************	***************************************	***************************************
Container:	5924501					
Date of Custody	User	Dept		Storage Location	Purpose	Empty
10/11/02 16:20	kcook	Sample I	Management	Cooler 3	Storage	
10/28/02 13:01	dbond	Metals		Cooler 3	Analysis	
10/28/02 15:16	dbond	Metals		Cooler 3	Storage	
Container:	5924502	***************************************	***************************************	***************************************	***************************************	***************************************
Date of Custody	User	Dept		Storage Location	Purpose	Empty
10/11/02 16:18	kcook	Sample I	Management	Cooler 2	Storage	
10/18/02 11:55	gnita-jo	Wet Che	mistry	Cooler 2	Analysis	
10/18/02 16:23	gnita-jo	Wet Che	mistry	Cooler 2	Storage	
Lab ID: Received into CA	592453 AS-Rochester Cust	<i>Matrix</i> lody: 10/1	SOIL 1/02 10:30:00			
Container:	5924531					
Date of Custody	User	Dept		Storage Location	Purpose	Empty
10/11/02 16:20	kcook	Sample I	Management	Cooler 3	Storage	
10/28/02 13:01	dbond	Metals		Cooler 3	Analysis	
10/28/02 15:16	dbond	Metais	***************************************	Cooler 3	Storage	
Container:	5924532					
Date of Custody	User	Dept		Storage Location	Purpose	Empty
10/11/02 16:18	kcook	Sample N	Management	Cooler 2	Storage	
10/18/02 11:55	gnita-jo	Wet Che	mistry	Cooler 2	Analysis	
10/18/02 16:23	gnita-jo	Wet Che	mistry	Cooler 2	Storage	
Lab ID:	592458	Matrix	WATER			
Received into CA	AS-Rochester Cust	ody: 10/1	1/02 10:30:00		***************************************	***************************************
Container:	5924581					
Date of Custody	User	Dept		Storage Location	Purpose	Empty
10/11/02 16:20	kcook 	Sample N	Management	Cooler 3	Storage	
10/28/02 8:44	dbond	Metals		Cooler 3	Analysis	
10/28/02 11:15	dhond	Motals		LTS	Storage	

Chain of	Custody	······	·····	•••••		•••••••••••••••••••••••••••••••••••••••
Submission:	R2214196	Client:	Exponent			
Lab ID:	599140	Matrix	SOIL			
Received into C	AS-Rochester Cus	tody: 11/6	5/02			
Container:	5991401					
Date of Custody	User	Dept		Storage Location	Purpose	Empty
11/06/02 10:24	bcollom	Sample N	Management	Cooler 2	Storage	
Container:	5991402		······································	***************************************	·····	
Date of Custody	User	Dept		Storage Location	Purpose	Empty
11/06/02 10:25	bcollom	Sample N	Management	Cooler 3	Storage	
11/07/02 7:19	dbond	Metals		Cooler 3	Analysis	
11/07/02 10:14	dbond	Metals		Cooler 3	Storage	
Lab ID: Received into Ca	599141 AS-Rochester Cust	<i>Matrix</i> lody: 11/6	SOIL			
Container:	5991411	***************************************	***************************************		······	*******************************
Date of Custody	User	Dept		Storage Location	Purpose	Empty
11/06/02 10:24	bcollom	Sample M	Management	Cooler 2	Storage	
Container:	5991412	***************************************	······································	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		***************************************
Date of Custody	User	Dept		Storage Location	Purpose	Empty
11/06/02 10:25	bcollom	Sample N	Management	Cooler 3	Storage	
11/07/02 7:19	dbond	Metals		Cooler 3	Analysis	
11/07/02 10:14	dbond	Metals		Cooler 3	Storage	

## **METALS DATA**

## METALS COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

				SDG No.:	SP0002
ub Code:		Case No.	:	SAS No.:	
OW No.: SW84	6 CLP-M	Client:	Exponent	<u> </u>	
	Sample No.		Lab Sample ID.		
	SP0001		592437		
	SPOOOID		592437D		
	SPOOOIS	<del></del>	5924378		
	SP0002		592438		
	SP0003		592439	<del></del>	
	SP0004		592440	<del></del>	
	SP0005		592441	<del></del>	
	SP0006		592442		
	SP0007		592443		
	SP0013		592444		
	SP0014		592445	<del></del>	
	SP0015		592446		
	SP0018		592450	<del></del>	
	SP0019		592453		
	GW0318		592458		
	SP0016		599140		
	SP0016D		599140D	<del></del>	
	SP0016S		5991408		
•	SP0020		599141		
			40		YES
ere ICP int	erelement correct:	ions applied	ur	Yes/No	
			ur		
ere ICP bac	kground correction	as applied?		Yes/No	YES
ere ICP back If yes-		ns applied?	re		
re ICP bac If yes- applica	kground correction	ns applied? erated befor d correction	re	Yes/No	YES
re ICP bac If yes- applica	kground correction were raw data gene tion of background	ns applied? erated befor d correction	re	Yes/No	YES
re ICP bac If yes- applica	kground correction were raw data gene tion of background	ns applied? erated befor d correction	re	Yes/No	YES
ere ICP bac If yes- applica	kground correction were raw data gene tion of background	ns applied? erated befor d correction	re	Yes/No	YES
If yes-vapplica	kground correction were raw data gene ation of background ee Attached Case N	ns applied? erated befor d correction farrative	re ns?	Yes/No Yes/No	YES NO
omments: Se	kground correction were raw data gene tion of background ee Attached Case N	as applied? erated before d correction farrative ge is in co	re	Yes/No Yes/No and conditions	YES NO s of the
omments: Se	kground correction were raw data gene tion of background ee Attached Case N at this data packa th technically and	as applied?  erated before d correction  arrative  ge is in co for comple	mpliance with the terms a	Yes/No Yes/No and conditions	YES NO s of the
omments: Se	kground correction were raw data gene tion of background mee Attached Case N  at this data packa th technically and mase of the data co	as applied?  erated before d correction  farrative  ge is in confor comple ntained in	ompliance with the terms a	Yes/No Yes/No and conditions the conditions ge and in the	NO Softhe detailed
certify the ntract, bot one. Release	kground correction were raw data gene ation of background ee Attached Case N  at this data packa th technically and ase of the data co dable data submitt	ge is in conformative in the formula on diske	ompliance with the terms are teness, for other than the this hardcopy data package.	Yes/No Yes/No and conditions the conditions ge and in the	NO Softhe detailed
certify that ntract, bot ove. Release Manager's	kground correction were raw data gene ation of background ee Attached Case N  at this data packa th technically and ase of the data co dable data submitt s designee, as ver	ge is in conformative intained in the desired by the desired by the desired in the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by th	ompliance with the terms and the terms and the third hardcopy data package the has been authorized the following signature.	Yes/No Yes/No and conditions he conditions ge and in the by the Labora	NO NO Softhe detailed
certify that the core is applicated by the core is applicated by the core is a core in the core is a core in the core is a core in the core is a core in the core in the core in the core in the core is a core in the core in the core in the core in the core is a core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in the core in t	kground correction were raw data gene ation of background ee Attached Case N  at this data packa th technically and ase of the data co dable data submitt	ge is in conformative intained in the desired by the desired by the desired in the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by the desired by th	ompliance with the terms atteness, for other than the this hardcopy data packagette has been authorized by	Yes/No Yes/No and conditions he conditions ge and in the by the Labora	NO NO Softhe detailed

-1-

#### **INORGANIC ANALYSIS DATA SHEET**

GW0318

mitract: R2214196

⊷ Code:

Case No.:

SAS No.:

SDG NO.: SP0002

rtrix (soil/water):

ivel (low/med):

WATER

LOW

Lab Sample ID: 592458

Date Received: 10/11/02

Concentration Units (ug/L or mg/kg dry weight):  $\mu$ G/L

CAS No.	Analyte	Concentration	C	Q	М
7439-97-6	Mercury	1.7			CV

color Before:

Clarity Before:

Texture:

wolor After:

Clarity After:

Artifacts:

comments:

-1-

#### **INORGANIC ANALYSIS DATA SHEET**

2	AMPLE	NO.	
Ę	SP0001		

Contract: R2214196

ab Code:

Case No.:

SAS No.:

SDG NO.: SP0002

[atrix (soil/water): SOIL/SEDIMENT

LOW

Lab Sample ID: 592437

Date Received: 10/11/02

Solids: 79.9

evel (low/med):

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Ω	M
7439-97-6	Mercury	750			CV

Color Before:

Clarity Before:

Texture:

Color After:

Clarity After:

Artifacts:

-1-

#### **INORGANIC ANALYSIS DATA SHEET**

SAMP	LE	NO	•	

SP0002

Contract: R2214196

ab Code:

Case No.:

LOW

SAS No.:

SDG NO.:

SP0002

latrix (soil/water):

SOIL/SEDIMENT

Lab Sample ID: 592438

Date Received: 10/11/02

Solids: 83.0

evel (low/med):

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	С	Q	M
7439-97-6	Mercury	128			CV

Color Before:

Clarity Before:

Texture:

Color After:

Clarity After:

Artifacts:

Comments:

825840115

21

-1-

## INORGANIC ANALYSIS DATA SHEET

SAMPLE	NO.
1	
1 650003	

Contract: R2214196

Lab Code:

Case No.:

SAS No.:

SDG NO.: SP0002

Matrix (soil/water):

SOIL/SEDIMENT

Lab Sample ID: 592439

Level (low/med):

Date Received: 10/11/02

5 Solids: 86.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	252			CV

Color Before:

Clarity Before:

Texture:

Color After:

Clarity After:

Artifacts:

olumbia	Analytical	Services
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-1-

#### **INORGANIC ANALYSIS DATA SHEET**

SA	MPLE	NO.

SP0004

ontract: R2214196

ED Code:

Case No.:

LOW

SAS No.:

SDG NO.: SP0002

atrix (soil/water): SOIL/SEDIMENT

Lab Sample ID: 592440

Date Received: 10/11/02

evel (low/med):

Solids: 80.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	С	Q	M
7439-97-6	Mercury	12.3			CV

Color Before:

Clarity Before:

Texture:

Color After:

Clarity After:

Artifacts:

Comments:

825840117

-1-

#### **INORGANIC ANALYSIS DATA SHEET**

SAMPLE	NO.

SP0005

ontract: R2214196

ub Code:

Case No.:

SAS No.:

SDG NO.: SP0002

itrix (soil/water):

SOIL/SEDIMENT

Lab Sample ID: 592441

ivel (low/med):

LOW

Date Received: 10/11/02

Solids: 77.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	С	Q	M
7439-97-6	Mercury	240			CV

!olor Before:

Clarity Before:

Texture:

Color After:

Clarity After:

Artifacts:

-1-

#### **INORGANIC ANALYSIS DATA SHEET**

SAMPLE NO.

SP0006	
--------	--

sontract: R2214196

Case No.:

LOW

SAS No.:

SDG NO.: SP0002

matrix (soil/water):

SOIL/SEDIMENT

Lab Sample ID: 592442

Date Received: 10/11/02

Solids: 85.2

Tevel (low/med):

يم Code:

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	С	Q	M
7439-97-6	Mercury	0.21			CV

color Before:

Clarity Before:

Texture:

color After:

Clarity After:

Artifacts:

comments:

25

-1-

#### **INORGANIC ANALYSIS DATA SHEET**

SAMPLE NO.

SP0007

ontract: R2214196

ab Code:

Case No.:

SAS No.:

SDG NO.:

SP0002

atrix (soil/water):

SOIL/SEDIMENT

Lab Sample ID: 592443

evel (low/med):

LOW

Date Received: 10/11/02

Solids: 80.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	С	Q	M
7439-97-6	Mercury	0.09			CV

Color Before:

Clarity Before:

Texture:

Color After:

Clarity After:

Artifacts:

comments:

-1-

#### **INORGANIC ANALYSIS DATA SHEET**

SAMPLE NO.

SP0013

₩ntract: R2214196

سه Code:

Case No.:

SAS No.:

SDG NO.: SP0002

matrix (soil/water):

SOIL/SEDIMENT

Lab Sample ID: 592444

revel (low/med):

LOW

Date Received: 10/11/02

Solids: 85.4

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	С	Q	M
7439-97-6	Mercury	13.3			CV

-olor Before:

Clarity Before:

Texture:

color After:

Clarity After:

Artifacts:

**comments**:

-1-

#### **INORGANIC ANALYSIS DATA SHEET**

SAMPLE NO.

SP0014

Contract: R2214196

Lab Code:

Case No.:

SAS No.:

SDG NO.: SP0002

Matrix (soil/water):

SOIL/SEDIMENT

Lab Sample ID: 592445

Date Received: 10/11/02

Level (low/med):

b Solids: 87.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	С	Ω	M
7439-97-6	Mercury	31.7			CV

Color Before:

Clarity Before:

Texture:

Color After:

Clarity After:

Artifacts:

olumbia	Anal	vtical	Services
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-1-

#### **INORGANIC ANALYSIS DATA SHEET**

SAMPLE NO.

SP0015

Intract: R2214196

no Code:

Case No.:

LOW

SAS No.:

SDG NO.: SP0002

itrix (soil/water): SOIL/SEDIMENT

Lab Sample ID: 592446

Date Received: 10/11/02

Tolids: 73.1

vel (low/med):

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	42.8			CV

Color Before:

Clarity Before:

Texture:

color After:

Clarity After:

Artifacts:

-1-

#### **INORGANIC ANALYSIS DATA SHEET**

SAMPLE NO.

SP0016

ontract: R2214196

ab Code:

Case No.:

SAS No.:

SDG NO.:

SP0002

atrix (soil/water):

SOIL/SEDIMENT

Lab Sample ID: 599140

Date Received: 11/06/02

LOW

Solids: 84.7

evel (low/med):

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	С	Q	M
7439-97-6	Mercury	0.04	ש		CV

Color Before:

Clarity Before:

Texture:

Color After:

Clarity After:

Artifacts:

-1-

#### **INORGANIC ANALYSIS DATA SHEET**

SAMPLE NO.

SP0018

ontract: R2214196

mo Code:

Case No.:

SAS No.:

SDG NO.: SP0002

atrix (soil/water): SOIL/SEDIMENT

Lab Sample ID: 592450

evel (low/med):

LOW

Date Received: 10/11/02

Rolids: 88.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	С	Q	M
7439-97-6	Mercury	2.8			CV

Color Before:

Clarity Before:

Texture:

Color After:

Clarity After:

Artifacts:

-1-

#### **INORGANIC ANALYSIS DATA SHEET**

SAMPLE NO.

SP0019

ontract: R2214196

ab Code:

Case No.:

SAS No.:

SDG NO.: SP0002

atrix (soil/water):

SOIL/SEDIMENT

Lab Sample ID: 592453

evel (low/med):

LOW

Date Received: 10/11/02

Solids: 79.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	16.6			CV

Color Before:

Clarity Before:

Texture:

Color After:

Clarity After:

Artifacts:

-1-

#### **INORGANIC ANALYSIS DATA SHEET**

SAMPLE NO.

SP0020

ontract: R2214196

xo Code:

Case No.:

SAS No.:

SDG NO.: SP0002

atrix (soil/water):

SOIL/SEDIMENT

Lab Sample ID: 599141

Fvel (low/med):

Date Received: 11/06/02

Solids: 81.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	М
7439-97-6	Mercury	0.04	Ū		CV

color Before:

Clarity Before:

Texture:

tolor After:

Clarity After:

Artifacts:

comments:

## -2A-

#### INITIAL AND CONTINUING CALIBRATION VERIFICATION

Contract: R2214196

ab Code:

Case No.:

SAS No.:

SDG NO.: SP0002

initial Calibration Source: PE PURE

Continuing Calibration Source: PE PURE

	Initial Calibration			Continuing Calibration				
Analyte	True	Found %R(1)	True	Found	%R(1)	Found	%R(1)	M
Mercury	3.0	2.93 97.7	3.0	2.93	97.7	2.7	92.0	cv

⁽¹⁾ Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

#### -2A-

#### INITIAL AND CONTINUING CALIBRATION VERIFICATION

ontract: R2214196

m Code:

Case No.:

SAS No.:

SDG NO.: SP0002

Mtial Calibration Source:

ontinuing Calibration Source: PE PURE

	Initial	Continuing Calibration						
Analyte	True	Found %R(1)	True	Found	%R(1)	Found	%R(1)	M
Mercury	1		3.0	2.99	99.7	3.0	0 100.0	CV

⁽¹⁾ Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

#### -2A-

## INITIAL AND CONTINUING CALIBRATION VERIFICATION

ntract: R2214196

ib Code:

Case No.:

SAS No.:

SDG NO.: SP0002

itial Calibration Source:

Intinuing Calibration Source: PE PURE

	Initial	Calibration	Continuing Calibration					$\prod$
Analyte	True	Found %R(1)	True	Found	%R(1)	Found	%R(1)	M
Mercury			3.0	3.04	101.3	3.0	2 100.7	CV

⁽¹⁾ Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

#### -2A-

## INITIAL AND CONTINUING CALIBRATION VERIFICATION

-ntract: R2214196

پ Code:

Case No.:

SAS No.:

SDG NO.: SP0002

Matial Calibration Source:

Intinuing Calibration Source: PE PURE

	Initial	Calibration	Continuing Calibration					
Analyte	True	Found %R(1)	True	Found	%R(1)	Found	%R(1)	M
Mercury	ĺ		3.0	3.05	101.7			CV

⁽¹⁾ Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

#### -2A-

## INITIAL AND CONTINUING CALIBRATION VERIFICATION

ontract: R2214196

ab Code:

Case No.:

SAS No.:

SDG NO.: SP0002

nitial Calibration Source: PE PURE

ontinuing Calibration Source: PE PURE

	Initial Ca	alibration	Continuing Calibration					
Analyte	True	Found %R(1)	True	Found	%R (1)	Found	%R(1)	м
Mercury	3.0	3.07   102.3	3.0	3.09	103.0	3.1	0 103.3	CV

⁽¹⁾ Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

#### -2A-

### INITIAL AND CONTINUING CALIBRATION VERIFICATION

montract: R2214196

wb Code:

Case No.:

SAS No.:

SDG NO.: SP0002

mitial Calibration Source:

Tontinuing Calibration Source: PE PURE

Concentration Units: ug/L

	Initial	Calibration	Continuing Calibration					
Analyte	True	Found %R(1)	True	Found	%R(1)	Found	%R(1)	M
Mercury	1		3.0	3.08	102.7	3.1	4 104.7	CV

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

#### -2A-

#### INITIAL AND CONTINUING CALIBRATION VERIFICATION

!ontract: R2214196

ab Code:

Case No.:

SAS No.:

SDG NO.: SP0002

nitial Calibration Source:

ontinuing Calibration Source: PE PURE

	Initial Calibration			Continuing Calibration					
Analyte	True	Found %R(1)	True	Found	%R(1)	Found	%R(1)	M	
Mercury			3.0	3.14	104.7			CV	

⁽¹⁾ Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

#### -2A-

#### INITIAL AND CONTINUING CALIBRATION VERIFICATION

matract: R2214196

⊶ Code:

Case No.:

SAS No.:

SDG NO.: SP0002

mtial Calibration Source: PE PURE

ontinuing Calibration Source: PE PURE

	Initial Calibration		Continuing Calibration					
Analyte	True	Found %R(1)	True	Found	%R(1)	Found	%R(1)	м
Mercury	3.0	3.04   101.3	3.0	3.03	101.0	3.0	2 100.7	CV

⁽¹⁾ Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

#### METALS -2B-

## CRDL STANDARD FOR AA AND ICP

ontract: R2214196

ab Code:

Case No.:

SAS No.:

SDG No.: SP0002

A CRDL Standard Source: CPI

CP CRDL Standard Source:

CPI

	CRDL Stand	lard for AA	In	CRDL Stan	dard f	for ICP Final		
Analyte	True	Found %R	True	Found	%R	Found	%R	
Mercury	0.2	0.21 105.0						

#### METALS -2B-

## CRDL STANDARD FOR AA AND ICP

ntract: R2214196

> Code:

Case No.:

SAS No.:

SDG No.: SP0002

CRDL Standard Source: CPI

? CRDL Standard Source:

CPI

	CRDL Stand	dard for A	A		In	CRDL Stan itial	dard fo	for ICP Final		
Analyte	True	Found	₹R		True	Found	%R	Found	₹R	
Mercury	0.2	0.19	95.0	П			1			

# METALS -2B-

#### CRDL STANDARD FOR AA AND ICP

ontract: R2214196

ab Code:

Case No.:

CPI

SAS No.:

SDG No.: SP0002

A CRDL Standard Source: CPI

CP CRDL Standard Source:

	CRDL Stand	dard for A	LA.	In:	CRDL Stan	dard f	for ICP Final		
Analyte	True	Found	%R	True	Found	%R	Found	%R	
Mercury	0.2	0.20	100.0					ī	

-3-

**BLANKS** 

ontract: R2214196

يس Code:

Case No.:

SAS No.:

SDG NO.: SP0002

reparation Blank Matrix (soil/water): SOIL

reparation Blank Concentration Units (ug/L or mg/kg): MG/KG

	Initial Calib. Blank			Cont	Preparation Blank						
Analyte	(ug/L)	С	1	C	2	C	3	c		c	M
Mercury	0.2	이 미	0.2	20 0	0.2	0 0	0.2	0   0	0.033	ס	CV

-3-

**BLANKS** 

ntract: R2214196

b Code:

Case No.:

SAS No.:

SDG NO.: SP0002

eparation Blank Matrix (soil/water): WATER

eparation Blank Concentration Units (ug/L or mg/kg): UG/L

	Initial Calib. Blank				inuing Blank	Preparation Blank						
Analyte	(ug/L)	C	1	C	2	C	3	С	<u> </u>	C		M
Mercury		Ī L	0.2	0 0	0.2	0 0	0.2	0 0			П	cv

numbia Analytical Services

**METALS** 

-3-

**BLANKS** 

_tract: R2214196

~ Code:

Case No.:

SAS No.:

SDG NO.: SP0002

eparation Blank Matrix (soil/water): WATER

eparation Blank Concentration Units (ug/L or mg/kg): UG/L

	Initial Calib. Blank			Cont	Preparation Blank	n.					
Analyte	(ug/L)	С	1	C	2	C	3	c		c	M
Mercury			0.2	20 0							Cv

Columbia Analytical Services

**METALS** 

-3-

**BLANKS** 

!ontract: R2214196

ab Code:

Case No.:

SAS No.:

SDG NO.: SP0002

reparation Blank Matrix (soil/water): WATER

reparation Blank Concentration Units (ug/L or mg/kg): UG/L

	Initial Calib. Blank			Con	tinuing Blank	Preparation Blank					
Analyte	(ug/L)	С	1	c	2	C	3	С	<u> </u>	c	M
Mercury	0.2	0 0	0.2	20   U	0.2	20 U	0.2	이   ㅁ	0.200	Ū	cv

-3-

**BLANKS** 

_tract: R2214196

_ Code:

Case No.:

SAS No.:

SDG NO.: SP0002

eparation Blank Matrix (soil/water): WATER

eparation Blank Concentration Units (ug/L or mg/kg): UG/L

	Initial Calib. Blank			Cont	Preparation Blank							
Analyte	(ug/L)	С	1	C	2	C	3	c		C	M	a
Mercury			0.2	20 0	0.2	ס   ס				Ī		$\overline{\mathbf{v}}$

-3-

**BLANKS** 

ontract: R2214196

ab Code:

Case No.:

SAS No.:

SDG NO.: SP0002

reparation Blank Matrix (soil/water): SOIL

reparation Blank Concentration Units (ug/L or mg/kg): MG/KG

	Initial Calib. Blank				inuing Blank	Preparation Blank						
Analyte	(ug/L)	С	1	C	2	C	3	С		c	M	
Mercury	0.2	이 미	0.2	0 0	0.2	ס ס			0.033	ש	l c	7

#### -5A-

#### SPIKE SAMPLE RECOVERY

~ ~ 1	MPLR	NIO
	шьгы	NU.

mtract: R2214196

SP0001S

₩ Code:

Case No.:

SAS No.:

SDG NO.: SP0002

Trix (soil/water): SOIL/SED

Level (low/med):

LOW

Solids for Sample: 79.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit %R	<b>-</b> *	•	С	Sample Result (SR)	C	Spike Added	(SA)	₹R	Q	M
Mercury			881.7456		750.4049	D	1 ,	0.19	69126.6		CV

ments:	 	 	 	 
	 	 · · · · · · · · · · · · · · · · · · ·	 	 
		 <u> </u>		 

#### METALS -5A-

#### SPIKE SAMPLE RECOVERY

SAMPLE NO.

SP0016S		

Contract: R2214196

Lab Code:

-----

Case No.:

SAS No.:

SDG NO.: SP0002

Matrix (soil/water):SOIL/SED

Level (low/med):

LOW

% Solids for Sample: 84.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

1	Analyte	Control	Spiked Sample	_	Sample	Spike	•				Ī
ı	Analyte	Limit %R	Result (SSR)	C	Result (SR)	Added	(SA)	%R	Q	M	İ
Ì	Mercury	75 - 125	0.2150		0.0381   υ	<u> </u>	0.19	114.7		CA	

Comments:			 	 	
		<del></del>	 	 <del></del>	

-6-

#### **DUPLICATES**

SAMPLE NO.

SP0001D

'ntract: R2214196

b Code:

Case No.:

SAS No.:

SDG NO.: SP0002

rix (soil/water): SOIL/SEDI

Level (low/med):

LOW

Rolids for Sample: 79.9

% Solids for Duplicate:

79.9

Concentration Units (ug/L or mg/kg dry weight):

MG/KG

Analyte	Control     Limit	Sample (S)	С	Duplicate	(D)	С	RPD	Q	M
Mercury		750.4049			901.2842		18.3		CV

olumbia Analytical Services

**METALS** 

-6-

#### **DUPLICATES**

SAMPLE NO.

SP0016D

ontract: R2214196

ab Code:

Case No.:

SAS No.:

SDG NO.: SP0002

itrix (soil/water): SOIL/SEDI

Solids for Sample: 84.7

Level (low/med):

LOW

% Solids for Duplicate: 84.7

Concentration Units (ug/L or mg/kg dry weight):

MG/KG

Analyte	Control     Limit	Sample (S	) с	Duplicate	(D) C	RPD	Q	M
Mercury			0.0381 U		0.0375   σ			CV

-7-

#### LABORATORY CONTROL SAMPLE

tract:	R2214196

Code:

Case No.:

SAS No.:

SDG NO.: SP0002

id LCS Source: ERA

.eous LCS Source:

Aqueous (ug/L)				Solid (mg/kg)						
Analyte	True	Found	%R	True	Found C	Limits	%R			
Mercury	ĺ			1.5	1.4	0.9	2.1 94.4			

-7-

## LABORATORY CONTROL SAMPLE

ontract: R2214196

ab Code:

Case No.:

SAS No.:

SDG NO.: SP0002

olid LCS Source:

queous LCS Source: CPI

	Aqueous	(ug/L)			Soli	Solid (mg/kg)			
Analyte	True	Found	%R	True	Found	C	Limits	%R	
Mercury	1.0	1.01	101.0		1		I		

-7-

#### LABORATORY CONTROL SAMPLE

ntract: R2214196

b Code:

Case No.:

SAS No.:

SDG NO.: SP0002

lid LCS Source: ERA

ueous LCS Source:

	Aqueous	(ug/L)			Solid (mg/kg)					
Analyte	True	Found	%R	True	Found C	Limits	%R			
Mercury				1.5	1.4	0.9	2.1 96.6			

## **GENERAL CHEMISTRY**

Reported: 11/16/02

Exponent

Project Reference: WOOD-RIDGE, NJ

Client Sample ID : SP0001

Date Sampled: 10/08/02 09:45 Date Received: 10/11/02 Order #: 592437 Submission #: R2214196 Sample Matrix: SOIL/SEDIMENT

ANALYTE	METHOD	PQL	RESULT	DRY WEIGHT		TIME ANALYZED	DILUTION	<u> </u>
PERCENT SOLIDS	160.0	1.0	79.9	*	10/18/02	14:00	1.0	

Reported: 11/16/02

rxponent

Project Reference: WOOD-RIDGE, NJ

'lient Sample ID : SP0002

Sample Matrix: SOIL/SEDIMENT

 Nate Sampled: 10/08/02 09:50
 Order #: 592438

 Jate Received: 10/11/02
 Submission #: R2214196

ANALYTE	METHOD_	PQL	RESULT	DRY WEIGHT UNITS		TIME ANALYZED	DILUTION	
PERCENT SOLIDS	160.0	1.0	83.0	ł	10/18/02	14:00	1.0	

Reported: 11/16/02

Exponent

Project Reference: WOOD-RIDGE, NJ

Client Sample ID : SP0003

Date Sampled: 10/08/02 09:55 Date Received: 10/11/02

Order #: 592439

Sample Matrix: SOIL/SEDIMENT

ANALYTE	METHOD	PQL	RESULT	DRY WEIGHT		TIME ANALYZED	DILUTION	
PERCENT SOLIDS	160.0	1.0	86.9	*	10/18/02	14:00	1.0	== 

Reported: 11/16/02

Exponent

_Project Reference: WOOD-RIDGE, NJ

Client Sample ID : SP0004

Date Sampled: 10/08/02 10:00 Order #: 592440
Date Received: 10/11/02 Submission #: R2214196

Sample Matrix: SOIL/SEDIMENT

ANALYTE	METHOD	PQL	RESULT	DRY WEIGHT UNITS		TIME ANALYZED	DILUTION
PERCENT SOLIDS	160.0	1.0	80.3	ł	10/18/02	14:00	1.0

Reported: 11/16/02

Exponent

Project Reference: WOOD-RIDGE, NJ

Client Sample ID : SP0005

Order #: 592441

Sample Matrix: SOIL/SEDIMENT

Date Sampled: 10/09/02 14:40 Date Received: 10/11/02 Submission #: R2214196

ANALYTE	METHOD	PQL	RESULT	DRY WEIGHT		TIME ANALYZED	DILUTION	
PERCENT SOLIDS	160.0	1.0	77.8	ŧ	10/18/02	14:00	1.0	

Reported: 11/16/02

Exponent

roject Reference: WOOD-RIDGE, NJ Tlient Sample ID: SP0006

Date Sampled: 10/09/02 14:43 ate Received: 10/11/02

Order #: 592442

Sample Matrix: SOIL/SEDIMENT

ANALYTE	METHOD	PQL	RESULT	DRY WEIGHT		TIME ANALYZED	DILUTION
PERCENT SOLIDS	160.0	1.0	85.2	*	10/18/02	14:00	1.0

Reported: 11/16/02

Exponent

Project Reference: WOOD-RIDGE, NJ

Client Sample ID : SP0007

Date Sampled: 10/09/02 14:50

Order #: 592443

Sample Matrix: SOIL/SEDIMENT

Date Received: 10/11/02

ANALYTE	METHOD	PQL	RESULT	DRY WEIGHT		TIME ANALYZED	DILUTION	_
PERCENT SOLIDS	160.0	1.0	80.7	*	10/18/02	14:00	1.0	— •

Reported: 11/16/02

Exponent

Project Reference: WOOD-RIDGE, NJ

Client Sample ID : SP0013

Date Sampled: 10/09/02 15:55
Date Received: 10/11/02

Order #: 592444

Sample Matrix: SOIL/SEDIMENT

ANALYTE	METHOD	PQL	RESULT	DRY WEIGHT UNITS		TIME ANALYZED	DILUTION
PERCENT SOLIDS	160.0	1.0	85.4	*	10/18/02	14:00	1.0

Reported: 11/16/02

Exponent

Project Reference: WOOD-RIDGE, NJ

Client Sample ID : SP0014

Date Sampled: 10/09/02 15:57 Date Received: 10/11/02

Order #: 592445

Submission #: R2214196

Sample Matrix: SOIL/SEDIMENT

ANALYTE	METHOD	PQL	RESULT	DRY WEIGHT		TIME ANALYZED	DILUTION
PERCENT SOLIDS	160.0	1.0	87.3	*	10/18/02	14:00	1.0

Reported: 11/16/02

Fxponent

Project Reference: WOOD-RIDGE, NJ

Client Sample ID : SP0015

Date Sampled: 10/09/02 16:10 Order #: 592446

Date Received: 10/11/02 Submission #: R2214196

Sample Matrix: SOIL/SEDIMENT

_							
ANALYTE	METHOD	PQL	RESULT	DRY WEIGHT UNITS		TIME ANALYZED	DILUTION
PERCENT SOLIDS	160.0	1.0	73.1	*	10/18/02	14:00	1.0

Reported: 11/16/02

Exponent

Project Reference: WOOD-RIDGE, NJ

Client Sample ID : SP0018

Date Sampled: 10/10/02 10:40

Order #: 592450

Sample Matrix: SOIL/SEDIMENT

Date Received: 10/11/02

ANALYTE	METHOD	PQL	RESULT	DRY WEIGHT UNITS		TIME ANALYZED	DILUTION	)
PERCENT SOLIDS	160.0	1.0	88.5	+	10/18/02	14:00	1.0	)

Reported: 11/16/02

Exponent

roject Reference: WOOD-RIDGE, NJ Client Sample ID : SP0019

Date Sampled: 10/10/02 10:55 ate Received: 10/11/02

Order #: 592453

Sample Matrix: SOIL/SEDIMENT

~ ANALYTE	METHOD	PQL	RESULT	DRY WEIGHT UNITS		TIME ANALYZED	DILUTION
PERCENT SOLIDS	160.0	1.0	79.0	*	10/18/02	14:00	1.0

Reported: 11/16/02

Exponent

Project Reference: WOODRIDGE, NJ

Client Sample ID : SP0016

Date Sampled: 10/09/02 Date Received: 11/06/02

Order #: 599140

Submission #: R2214196

Sample Matrix: SOIL/SEDIMENT

ANALYTE	METHOD	PQL	RESULT	DRY WEIGHT UNITS		TIME ANALYZED	DILUTION	-
PERCENT SOLIDS	160.0	1.0	84.7	ŧ	11/08/02	11:16	1.0	

Reported: 11/16/02

Exponent

-Project Reference: WOODRIDGE, NJ

Client Sample ID : SP0020

Date Sampled: 10/10/02
Date Received: 11/06/02

Order #: 599141 Submission #: R2214196 Sample Matrix: SOIL/SEDIMENT

ANALYTE METHOD PQL RESULT UNITS ANALYZED ANALYZED DILUTION

PERCENT SOLIDS 160.0 1.0 81.1 % 11/08/02 11:16 1.0

# RECEIVED

JAN - 9 2003

At Exponent January 8, 2003



Mr. Dave Lamadrid Exponent 4000 Kruseway Place Bldg. 2, Suite 285 Lake Oswego, OR 97035

PROJECT: WOOD-RIDGE, NJ

Submission #: R2214662

Dear Mr. Lamadrid:

Enclosed are additional report pages for the above referenced project. Samples SP0043 and SP0044 were inadvertently left out of the report package that was previously sent to you. Please replace or insert these pages into the previous report package. I apologize for any inconvenience this may have caused. Should you have any questions please contact me at (585) 288-5380.

Sincerely,

COLUMBIA ANALYTICAL SERVICES

Michael Perry

Laboratory Director

Enc.



1 Mustard ST. Suite 250 Rochester, NY 14609 (585) 288-5380

#### THIS IS AN ANALYTICAL TEST REPORT FOR:

Client : Exponent

Project Reference: WOOD-RIDGE, NJ

Lab Submission # : R2214662

Project Manager : Michael Perry

Reported : 12/30/02

Report Contains a total of pages

The results reported herein relate only to the samples received by the laboratory. This report may not be reproduced except in full, without the approval of Columbia Analytical Services.

This package has been reviewed by Columbia Analytical Services' QA Department/Laboratory Director to comply with NELAC standards prior to report submittal.

# **SDG NARRATIVE**

#### **CASE NARRATIVE**

COMPANY: Exponent SUBMISSION #: R2214662

NYS DEC samples were collected on 11/13/02 and received at CAS on 11/14/02 at a cooler temperature of 5 °C. See the CAS CLP Batching sheet for a cross-reference between Client ID and CAS Job # and analyses requested. A NJ Reduced deliverable data validation package was prepared.

#### **METALS ANALYSIS**

Twelve soil samples were analyzed for Total Mercury by EPA SW-846 method 7471.

The Blank Spike (LCS) and Matrix spike recoveries were all acceptable.

No other analytical or QC problems were encountered.

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SDG #: SB-33A BATCH COMPLETE: yes DATE REVISED: SUBMISSION R2214662 DISKETTE REQUESTED: Y_X_ N___ DATE DUE: 1/08/03 CLIENT: Exponent DATE: 12/11/02 PROTOCOL: SW846 CLIENT REP: Michael Perry CUSTODY SEAL: PRESENT SHIPPING No.:

	MICHAEL FELLY		SEAD. FRESENT		SHIFFING NO.	•		
PROJECT:	WOOD-RIDGE, NJ	CHAIN O	F_CUSTODY: PRESENT		SUMMARY PKG:	YX_ N	_	
CAS JOB #	CLIENT/EPA ID	MATRIX	REQUESTED PARAMETERS	DATE	DATE	рН	*	REMARKS
				SAMPLED	RECEIVED	(SOLIDS	SOLIDS	
601495	SP0023	SOIL	HG + QC	11/13/02	11/14/02			-
601496	SP0024	SOIL	HG	11/13/02	11/14/02			
601497	SP0038	SOIL	НG	11/13/02	11/14/02			
601498	SP0039	SOIL	HG	11/13/02	11/14/02			
601499	SP0040	SOIL	HG	11/13/02	11/14/02			•
601500	SP0054	SOIL	HG	11/13/02	11/14/02			
601501	SP0055	SOIL	НG	11/13/02	11/14/02			
605311	SP0041	SOIL	HG	11/13/02	12/2/2002*			
605312	SP0056	SOIL	HG		12/2/2002*			
606680	SP0042	SOIL	HG	11/13/02	12/6/2002*			
607619	SP0043	SOIL	HG	11/13/02	12/11/2002*			
607620	SP0044	SOIL	HG	11/13/02	12/11/2002*			
			*Date Analysis was added					
			per clients instructions.					
						ļ		
	<u> </u>							







Effective 11/4/2002

### **INORGANIC QUALIFIERS**

#### C (Concentration) qualifier -

- B if the reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but was greater than or equal to the Instrument Detection Limit (IDL).
- U if the analyte was analyzed for, but not detected

#### Q qualifier - Specified entries and their meanings are as follows:

- D Spike was diluted out
- E The reported value is estimated because of the presence of interference.
- J Estimated Value
- M Duplicate injection precision not met.
- N Spiked sample recovery not within control limits.
- S The reported value was determined by the Method of Standard Additions (MSA).
- W Post-digestion spike for Furnace AA Analysis is out of control limits (85-115), while sample absorbance is less than 50% of spike absorbance.
- * Duplicate analysis not within control limits.
- +- Correlation coefficient for the MSA is less than 0.995.

#### M (Method) qualifier:

- "P" for ICP
- "A" for Flame AA
- "F" for Furnace AA
- "PM" for ICP when Microwave Digestion is used
- "AM" for Flame AA when Microwave Digestion is used
- "FM" for Furnace M when Microwave Digestion is used
- "CV" for Manual Cold Vapor AA
- "AV" for Automated Cold Vapor AA
- "CA" for Midi-Distillation Spectrophotometric
- "AS" for Semi-Automated Spectrophotometric
- "C" for Manual Spectrophotometric
- "T" for Titrimetric
- " " where no data has been entered
- "NR" if the analyte is not required to be analyzed.

#### CAS/Rochester Lab ID # for State Certifications

Army Corp of Engineers Validated
Delaware Accredited
Connecticut ID # PH0556
Florida ID # E87674
Massachusetts ID # M-NY032
Navy Facilities Engineering Service Center Approved
Nebraska Accredited
H:\GROUPFORMS\QUALIF_I.DOC

NELAP Accredited New York ID # 10145 New Jersey ID # NY004 New Hampshire ID # 294100 A/B Rhode Island ID # 158 South Carolina ID #91012 West Virginia ID # 292

# CHAINS OF CUSTODY INTERNAL CHAINS

CHAIN OF	CUSTO	DY K	<u>ECOI</u>	<u> </u>	<u>ampli</u>	E ANAI	LYSIS	REQU	EST FORM	1 1221		Page _/_ or
Project: (Name and Number)	Ventron	Velsi	1001-	wood	Ridges	3600	B3N.	005 09	402			$\mathbf{E}^{\mathbf{x}}$ ponent
Exponent Contact: D	wid Lam	adria	Offic	:LO	Samplers:	David	Lama	deid				Bellevue, WA
Ship to: Columbia			rvice				Analyses Ro			i i		(425) 643-9803 Boston, MA
	ard Stren			<u>50</u>						<u>š</u>		(781) 466-6681 Boulder, CO
Roches	ter, NY	1460	39			4				Container		(303) 444-7270 Fortland, OR
Lab Contact/Phone:	mike Per	13 (58	<u>5)288</u>	-5380	]	tel ercura 1747				Extra Co	Archive	인 (503) 636-4338 <b>Washington, D.C.</b> (301) 577-7830
Sample No.	Tag No.	Date	Time	Matrix		Tot Me EPA				ă	Ā	Remarks
SCOOZZ	37801	11/13/02	0935	SL		X						
580024	37802		0742	<u> </u>		LX_					X	
SP0025	37803		0945	$ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ldsymbol{ld}}}}}}}}}$							X	Potential analysis
50026	37804		0955								X	of exchise sample
SP0027	37805		6757								X	Lused on initial
SP0028	37806		1005	Ш_	ļ						X	results. Fax result
S10029	37807		1008								X	as soon as
Sf0030	37808		1015								X	mailabe
50031	37807	<u> </u>	1018			<u> </u>					X	
SP0032	37810		10.32			<u></u>					X	
560033	7811		1038								Х	
510034	37812		1045								X	
590035	37813		1048								X	
550036	37814		1105									
590037	37815		1108									
Sf0038	37816		1210			X						
550039	37817		1212			X						
SF0040	37818		1215			X						
560041	37819		1218								X	
SPOOTZ	37820	V	1225								X	
Matrix Code: GW - Groundv		I SD - Se			face water	Priority:	Normal	Rush	n Rush time per	iod	<u> </u>	
Shipped FedEx	√UPS ☐ Cour	rier Other	· - · · · · · · · · · · · · · · · · · ·			Condition of Upon Rece		bood		Custody S	eal Intact	Yes No None
Relinquished by:		nature)	I	Da	ate/Time: <u>[] - [</u>	1-02/170	P Received	by: <u></u>	Storefure,	<u> </u>		Date/Time: 11/14/2 930
Relinquished by:		,		Da	ate/Time:		_ Received	by:				Date/Time:
	(Sig	nature)					_		(Signature	)		-
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Distribution: White and Yellow Copies - Accompany Shipment; Pink Copy - Project File 

CHAIN OF CUSTODY HECORUSAMPLE ANALYSIS REQUEST FURM 1 - 2. 11 1 Page - 1 Exponent Project: (Name and Number) Ventron / Velsicol Wood-Ridgesite 8600B3N.005 040Z David Lamadrid Bellevue, WA Exponent Contact: David Lamadrid Office: Lo Samplers: (425) 643-9803 Ship to: Columbia Analytical Services Boston, MA **Analyses Requested** (781) 466-6681 Mustard Street Suite 250 Container Boulder, CO (303) 444-7270 Mercury EFA 7471 Rochester NY 14609 Portland, OR Lab Contact/Phone: Mike (err) (585)288 - 5380 (503) 636-4338 Washington, D.C. (301) 577-7830 Tag No. Matrix Sample No. Date Time Remarks SL 11/13/02/1227 580043 77822 M 590044 1230 510045 LS&CE 1233 5 PO046 37824 1245 37825 1248 S 90047 results as soon SP0048 37826 1300 as available Sf0049 27827 1320 510050 37828 1323 S 600 51 1340 37829 580052 1343 37830 Sf0053 17831 1400 Sf0054 **スフを32** 1440 1445 SF0055 37833 5,0056 37834 1448 510057 37835 1455 510058 37836 1458 S10059 37837 1505 Sf0060 1508 37838 SF0061 37837 1515 518 58006Z Priority: GW - Groundwater SL - Soil SD - Sediment SW - Surface water Normal Rush Rush time period OTHER - Please identify codes-Condition of Samples Shipped **Custody Seal Intact:** FedEx/UPS Courier Other_ Yes No None Upon Receipt: . Date/Time: 11-13-02/1700 Received by: (Signature) Relinquished by: Date/Time: WH 2 930 Relinquished by: _____ Date/Time: Received by: Date/Time:

Project: (Name and Number)	Ventron/										(	•	E ^x ponent
Exponent Contact:				ce: <u>Lo</u>	Samplers:	Davic	1 Lama	drid	•				Bellevue, WA (425) 643-9803
Ship to: Columb	in Analy1	icul S	Crvice	2.			Analyses R						Boston, MA
	and stree			0						T	<u>ğ</u>		(781) 466-6681
<u> Roches</u>	ter, NY	1460	9			205					at re	Ì	
Lab Contact/Phone:	Mike Perry	(282)	<u> 288 - 8</u>	5380		Total mercurs EPA 747	:				Extra Container	Archive	Fortland, OR  9 (503) 636-4338  Washington, D.C.  (201) 577-7830
Sample No.	Tag No.	Date	Time	Matrix		15 g g			i		Ext	A	(301) 577-7830 Remarks
Sf0063	37841	11-13-02	1525	SL								X	
SF0064	37842	1	1528									X	
SP0065	37843		1545									X	Potential analysis
580066	37844		1548									X	of archive sample
SP0067	37845	<u> </u>	1605									X	based as initial
50068	37846	V	1620	4								メ	results. Fox
			<u> </u>										results as soon
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			-	11-13	9-02					<u> </u>			
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			ļ		<u> </u>							<u> </u>	
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			<u> </u>		ļ								
			<u></u>	<u></u>	}								<u> </u>
Code.	lwater SL - Soil		ediment	SW - Su	rface water	Priority:	Normal	Rush	Rush t	time perio	d		
Shipped FedE	x/UPS Cour	ier Other	·			Condition o Upon Rece	ipt:			<del></del>	Custody Se	eal Intact	Yes No None
Relinquished by:	mil Lar		il	D.	ate/Time: //~	13-02/170	Ø Received	by: Har	dedar				Date/Time: 11 12 930
Relinquished by:	(Sig	nature)		Da	ate/Time:	•	Received	l by:	(	e-gryature)			Date/Time:
	(Sig	nature)					_	-		(Signature)			
ထ			<b>5</b> :		146-14 1 V	'ellow Conies -	A	Phinanast Dial	Conu Broi	iost Eilo			3223

# Cooler Receipt And Preservation Check Form

1. Were custody seals on outside of cooler? 2. Were custody papers properly filled out (ink, 3. Did all bottles arrive in good condition (unbrod. Did any VOA vials have significant air bubble. Were Ice or Ice packs present? 6. Where did the bottles originate? 7. Temperature of cooler(s) upon receipt:  Is the temperature within 0° - 6° C?:  If No, Explain Below  Date/Time Temperatures Taken:  Thermometer ID: 161 or IR GUN Record of Temperature, Client Approval to Run San	signed, etc.)? oken)? es? Yes No Pu2 eading From:	YES YES YES YES YES YES No	NO NO NO NO NO NO NO CLIENT  Yes Yes No No Sample Bottle
2. Were custody papers properly filled out (ink, 3. Did all bottles arrive in good condition (unbro 4. Did any VOA vials have significant air bubble. Were Ice or Ice packs present?  6. Where did the bottles originate?  7. Temperature of cooler(s) upon receipt:  Is the temperature within 0° - 6° C?:  Yell No, Explain Below  Date/Time Temperatures Taken:  Thermometer ID: 161 or IR GUN Receipts	es? Yes No PUZ eading From:	YES YES YES YES YES YES CAS/R Yes No	NO NO N/A NO OC, CLIENT  Yes Yes No No
If No, Explain Below No  Date/Time Temperatures Taken:  Thermometer ID: 161 or IR GUN Re	No No 942 eading From:	No ·	No No
Date/Time Temperatures Taken:	942		
Thermometer ID: 161 or IR GUN Re	eading From:	Temp Blank 7	Sample Bottle
, out of Jemperature, cheur Approvar to Nun Sa.	TOTAL OF		Danpie Bottle
<ol> <li>Were correct containers used for the tests indiced.</li> <li>Air Samples: Cassettes / Tubes Intact Cassettes in any discrepancies:</li> </ol>		vized Tedlar	NO Bags Inflated
YES NO S	Sample 1.D.	Reagent	Vol. Added
pH Respent			
12 NaOH	-		
2 HNO,			
2 H ₂ SO ₄			
Residual Chlorine (+/-) for TCN & Phenol			
5-9** P/PCBs (608 only)  YES = All samples OK NO = Samples were preserved	1-1-1-1	PC OV I	
**If pH adjustment is required, use NaOH and/or H ₂ SO.	at tau as histed	PC OK 10 adjus	si ph
VOC Vial pH Verification (Tested after Analysis) Following Samples Exhibited pH > 2			
	_		
Other Comments:			

Chain of	Custody									
Submission:	R2214662	Client:	Exponent							
Lab ID:	601495	Matrix	SOIL							
Received into C/	AS-Rochester Cust	ody: 11/14/	02 9:30:00 A	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	*****************************	***************************************				
Container:	6014951									
Date of Custody	User	Dept		Storage Location	Purpose	Empty				
11/14/02 14:41	hlovejoy	Sample Ma	nagement	Cooler 3	Storage					
11/26/02 9:27	dbond	Metals		Cooler 3	Analysis					
11/26/02 10:50	dbond	Metals		Cooler 3	Storage					
Container:	6014952			·	***************************************	***************************************				
Date of Custody	User	Dept		Storage Location	Purpose	Empty				
11/14/02 14:41	hlovejoy	Sample Ma	nagement	Cooler 2	Storage					
Lab ID:	601496 AS-Rochester Cust	• • • • • • • • • • • • • • • • • • • •	SOIL /02 9:30:00 A		***************************************					
Container:	6014961									
Date of Custody	User	Dept		Storage Location	Purpose	Empty				
11/14/02 14:41	hlovejoy	Sample Ma	nagement	Cooler 2	Storage					
Container:	6014962	***************************************	<del>1900-1900-1900-1900-1900-1900-190</del> 0-1900-190		***************************************	***************************************				
Date of Custody	User	Dept		Storage Location	Purpose	Empty				
11/14/02 14:41	hlovejoy	Sample Ma	nagement	Cooler 3	Storage					
11/26/02 9:27	dbond	Metals		Cooler 3	Analysis					
11/26/02 10:50	dbond	Metals		Cooler 3	Storage					
Lab ID: 601497 Matrix SOIL  Received into CAS-Rochester Custody: 11/14/02 9:30:00 A										
Container:	6014971	***************************************				***************************************				
Date of Custody	User	Dept		Storage Location	Purpose	Empty				
11/14/02 14:41	hlovejoy	Sample Ma	nagement	Cooler 3	Storage					
11/26/02 9:27	dbond	Metals		Cooler 3	Analysis					
11/26/02 10:50	dbond	Metals		Cooler 3	Storage					
Container:	6014972				***************************************	•••••••••••••••••••••••••				
Date of Custody	User	Dept		Storage Location	Purpose	Empty				
11/14/02 14:41	hlov <b>ejoy</b>	Sample Ma	inagement	Cooler 2	Storage					

Submission:	R2214662	Client:	Exponent			
Lab ID:	601498	Matrix	SOIL			
Received into C	AS-Rochester Cus	tody: 11/1	4/02 9:30:00 A		************************	
Container:	6014981					
Date of Custody	User	Dept		Storage Location	Purpose	Empty
11/14/02 14:41	hlovejoy	Sample I	Management	Cooler 2	Storage	
Container:	6014982	***************************************	······································		······································	·····
Date of Custody	User	Dept		Storage Location	Purpose	Empty
11/14/02 14:41	hlovejoy	Sample I	Management	Cooler 3	Storage	
11/26/02 9:27	dbond	Metals	· · · · · · · · · · · · · · · · · · ·	Cooler 3	Analysis	
11/26/02 10:50	dbond	Metals		Cooler 3	Storage	
<i>Lab ID:</i> Received into C	601499 AS-Rochester Cus	<i>Matrix</i> tody: 11/1	SOIL 14/02 9:30:00 A			
Container:	6014991		***************************************	***************************************	***************************************	******************************
Date of Custody	User	Dept		Storage Location	Purpose	Empty
11/14/02 14:41	hlovejoy		Management	Cooler 3	Storage	
11/26/02 9:27	dbond	Metals	· · · · · · · · · · · · · · · · · · ·	Cooler 3	Analysis	
11/26/02 10:50	dbond	Metals	-	Cooler 3	Storage	
Container:	6014992					
Date of Custody	User	Dept		Storage Location	Purpose	Empt
11/14/02 14:41	hlovej <b>o</b> y	Sample	Management	Cooler 2	Storage	. 🗆
Lab ID:	601500	Matrix	SOIL			
Received into C	:AS-Rochester Cus	tody: 11/	14/02 9:30:00 A			
Container:	6015001					
	User	Dept		Storage Location	Purpose	Emp
Date of Custody	hlovejoy	Sample	Management	Cooler 2	Storage	
Date of Custody 11/14/02 14:41		***************************************	***************************************	······	***************************************	
	6015002					
11/14/02 14:41	6015002 User	Dept		Storage Location	Purpose	Emp
11/14/02 14:41  Container:			Management	Storage Location Cooler 3	Purpose Storage	Emp
11/14/02 14:41  Container:  Date of Custody	User		Management			Emp

Chain of	Custody					
Submission:	R2214662	Client:	Exponent			
Lab ID:	601501	Matrix	SOIL			
Received into C	AS-Rochester Cus	tody: 11/14	4/02 9:30:00 A		*******************************	**************************
Container:	6015011					
Date of Custody	User	Dept		Storage Location	Purpose	Empty
11/14/02 14:41	hlovejoy	Sample M	lanagement	Cooler 3	Storage	
11/26/02 9:27	dbond	Metals	· · · · · · · · · · · · · · · · · · ·	Cooler 3	Analysis	
11/26/02 10:50	dbond	Metals		Cooler 3	Storage	
Container:	6015012	***************************************	••••••••••••••••••	***************************************	***************************************	······································
Date of Custody	User	Dept		Storage Location	Purpose	Empty
11/14/02 14:41	hlovejoy	Sample M	lanagement	Cooler 2	Storage	
Lab ID:	605311 AS-Rochester Cust	<i>Matrix</i> lody: 12/2/	SOIL 02 9:30:00 AM			
Container:	6053111					
Date of Custody	User	Dept		Storage Location	Purpose	Empty
12/02/02 10:07	hlovejoy	Sample M	lanagement	Cooler 3	Storage	
12/05/02 7:21	dbond	Metals		Cooler 3	Analysis	
12/05/02 9:04	dbond	Metals		Cooler 3	Storage	
Container:	6053112					
Date of Custody	User	Dept		Storage Location	Purpose	Empty
12/02/02 10:07	hlovejoy	Sample M	lanagement	Cooler 2	Storage	
Lab ID:	605312 AS-Rochester Cust	<i>Matrix</i> ody: 12/2/	SOIL 02 9:30:00 AM			
Container:	6053121					
Date of Custody	User	Dept		Storage Location	Purpose	Empty
12/02/02 10:07	hlovejoy	Sample M	anagement	Cooler 2	Storage	
Container:	6053122					
Date of Custody	User	Dept		Storage Location	Purpose	Empty
12/02/02 10:07	hlovejoy	Sample M	lanagement	Cooler 3	Storage	
12/05/02 7:22	dbond	Metals		Cooler 3	Analysis	
12/05/02 9:04	dbond	Metals		Cooler 3	Storage	

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Submission:	R2214662	Client:	Exponent			
Lab ID:	606680	Matrix	SOIL			
Received into CA	AS-Rochester Cust	ody: 12/6/0	2 9:30:00 AM	······································	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	************
Container:	6066801					
Date of Custody	User	Dept		Storage Location	Purpose	Empt
12/06/02 8:56	gesmeria	Sample Mar	nagement	Cooler 2	Storage	
Container:	6066802					***************************************
Date of Custody	User	Dept		Storage Location	Purpose	Empty
12/06/02 8:56	gesmeria	Sample Mai	nagement	Cooler 3	Storage	
12/09/02 8:47	dbond	Metals		Cooler 3	Analysis	
Lab ID: Received into C/	607619 AS-Rochester Cus		SOIL 702			
Container:	6076191	***************************************		***************************************	***************************************	<del></del>
Date of Custody	User	Dept		Storage Location	Purpose	Empty
12/11/02 9:49	hlovejoy	Sample Ma	nagement	Cooler 3	Storage	
12/11/02 10:14	dbond	Metals		Cooler 3	Analysis	
12/11/02 10:51	dbond	Metals		Cooler 3	Storage	
Container:	6076192					
Date of Custody	User	Dept	•	Storage Location	Purpose	Empty
12/11/02 9:49	hlovejoy	Sample Ma	nagement	Cooler 2	Storage	
Lab ID:	607620	Matrix	SOIL			
Received into C	AS-Rochester Cus	tody: 12/11	/02		······	
Container:	6076201					
Date of Custody	User	Dept		Storage Location	Purpose	Empty
12/11/02 9:49	hlovejoy	Sample Ma	nagement	Cooler 2	Storage	
Container:	6076202					
Date of Custody	User	Dept		Storage Location	Purpose	Empt
12/11/02 9:49	hlovejoy	Sample Ma	anagement	Cooler 3	Storage	
12/11/02 10:14	dbond	Metals		Cooler 3	Analysis	

# **METALS DATA**

# METALS COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

ontract: R2214	1662		<u> </u>	EDG No.:	SP0023
ab Code:	Case No.:		s	AS No.:	
IOW No.: SW846 CI	P-M Client:	Exponent			
	Sample No.	Lab	Sample ID.		
	SP0023	6014	195		
	SP0023D	6014	95D	•	
	SP0023S	6014	1958	•	
	SP0024	6014	196	•	
	SP0038	6014		•	
	SP0039	6014	198	•	
	SP0040	6014	199	1	
	SP0054	601	500	•	
	SP0055	601		•	
	SP0041	6053	311	•	
	SP0056	6053	312	•	
	SP0042	6066	80		
	SP0043	6076			
	SP0043D	6076	19D		
	SP00438	6076	198		
	SP0044	6076	520		
Were ICP interel	ement corrections applied?	•		Yes/No	YES
_	ound corrections applied?			Yes/No	YES
-	raw data generated before of background corrections			Yes/No	NO
Comments: See A	ttached Case Narrative				
contract, both to bove. Release computer-readable	his data package is in compechnically and for complete of the data contained in the data submitted on disket signee, as verified by the	eness, for o his hardcopy te has been	ther than the cond data package and authorized by the	ditions in the	detailed
ignature: Mac	hul Klen	Name:	Michael Kle Laboratory Man	w7	<del></del>
ite:i	18/03	Title:	Laboratory Man	age	

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# INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

SP0023	

_ontract: R2214662

سه Code:

Case No.:

SAS No.:

SDG NO.: SP0023

matrix (soil/water): SOIL/SEDIMENT

Lab Sample ID: 601495

>evel (low/med):

LOW

Date Received: 11/14/02

Solids: 87.1

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	С	Q	M
7439-97-6	Mercury	0.33			CV

Clarity Before:

Texture:

_olor After:

Clarity After:

Artifacts:

~omments:

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# **METALS**

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# **INORGANIC ANALYSIS DATA SHEET**

SAMPLE NO.

SP0024

ontract: R2214662

Case No.:

SAS No.:

SDG NO.: SP0023

atrix (soil/water): SOIL/SEDIMENT

Lab Sample ID: 601496

svel (low/med):

LOW

Date Received: 11/14/02

Solids: 81.0

ab Code:

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	С	Q	M
7439-97-6	Mercury	0.05			CV

!olor Before:

Clarity Before:

Texture:

Color After:

Clarity After:

Artifacts:

:comments:

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# INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

SP0038

Contract: R2214662

Tab Code:

Case No.:

LOW

SAS No.:

SDG NO.: SP0023

Watrix (soil/water): SOIL/SEDIMENT

Lab Sample ID: 601497

Date Received: 11/14/02

Solids: 87.5

Fevel (low/med):

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	С	Q	M
7439-97-6	Mercury	52.6			cv

Color Before:

Clarity Before:

Texture:

Color After:

Clarity After:

Artifacts:

Comments:

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# INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

SP0039

ontract: R2214662

Case No.:

SAS No.:

SDG NO.: SP0023

strix (soil/water): SOIL/SEDIMENT

Lab Sample ID: 601498

3vel (low/med):

LOW

Date Received: 11/14/02

Solids: 84.4

ab Code:

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.04	ਹ		CV

!olor Before:

Clarity Before:

Texture:

:olor After:

Clarity After:

Artifacts:

:omments:

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# **INORGANIC ANALYSIS DATA SHEET**

SAMPLE	NO.

SP0040

ontract: R2214662

πρ Code:

Case No.:

SAS No.:

SDG NO.: SP0023

Mtrix (soil/water): SOIL/SEDIMENT

Lab Sample ID: 601499

Date Received: 11/14/02

evel (low/med):

Solids: 76.7

LOW

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	С	Q	M
7439-97-6	Mercury	172			cv

color Before:

Clarity Before:

Texture:

color After:

Clarity After:

Artifacts:

comments:

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# **INORGANIC ANALYSIS DATA SHEET**

SAMPLE NO.

SP0054

Contract: R2214662

ab Code:

Case No.:

SAS No.:

SDG NO.: SP0023

(atrix (soil/water):

SOIL/SEDIMENT

LOW

Lab Sample ID: 601500

Date Received: 11/14/02

Solids: 79.1

evel (low/med):

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	67.1			CV

Color Before:

Clarity Before:

Texture:

Color After:

Clarity After:

Artifacts:

Comments:

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# **INORGANIC ANALYSIS DATA SHEET**

SAMPLE NO.

SP0055	SP0	05	5		
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_ontract: R2214662

_ab Code:

Case No.:

SOIL/SEDIMENT

SAS No.:

SDG NO.: SP0023

matrix (soil/water):

Lab Sample ID: 601501

mevel (low/med):

LOW

Date Received: 11/14/02

E Solids: 82.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	162			CV

__olor Before:

Clarity Before:

Texture:

__olor After:

Clarity After:

Artifacts:

_lomments:

Columbia Analytical Services

# **METALS**

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# INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

SP0041

lontract: R2214662

ab Code:

Case No.:

SAS No.:

SDG NO.: SP0023

atrix (soil/water): SOIL/SEDIMENT

Lab Sample ID: 605311

LOW

Date Received: 12/02/02

Solids: 78.4

evel (low/med):

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	С	Ω	M
7439-97-6	Mercury	52.1			CV

Color Before:

Clarity Before:

Texture:

Color After:

Clarity After:

Artifacts:

Comments:

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# **INORGANIC ANALYSIS DATA SHEET**

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24	MPLI	s no	_

S	P	0	0	5	6
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_ontract: R2214662

Case No.:

SAS No.:

SDG NO.: SP0023

watrix (soil/water):

_ab Code:

SOIL/SEDIMENT

Lab Sample ID: 605312

wevel (low/med):

LOW

Date Received: 12/02/02

₹ Solids: 80.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7439-97-6	Mercury	0.04			cv

_olor Before:

Clarity Before:

Texture:

_olor After:

Clarity After:

Artifacts:

_.omments:

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# **METALS**

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# INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

SP0042

ntract: R2214662

b Code:

Case No.:

SAS No.:

SDG NO.: SP0023

.trix (soil/water): SOIL/SEDIMENT

Lab Sample ID: 606680

:vel (low/med):

LOW

Date Received: 12/06/02

Solids: 78.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	С	Q	м
7439-97-6	Mercury	35.0			CV

olor Before:

Clarity Before:

Texture:

olor After:

Clarity After:

Artifacts:

omments:

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# **INORGANIC ANALYSIS DATA SHEET**

SP0043

_ontract: R2214662

Case No.:

SAS No.:

SDG NO.: SP0023

watrix (soil/water):

_ab Code:

SOIL/SEDIMENT

Lab Sample ID: 607619

wivel (low/med):

LOW

Date Received: 12/11/02

Solids: 83.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

	CAS No.	Analyte	Concentration	C	Q	M
Ī	7439-97-6	Mercury	0.75			CV

_olor Before:

Clarity Before:

Texture:

_olor After:

Clarity After:

Artifacts:

_omments:

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# **INORGANIC ANALYSIS DATA SHEET**

SAMP	LE	NO.	
			_

SP0044

Contract: R2214662

Lab Code:

Case No.:

LOW

SAS No.:

SDG NO.: SP0023

Matrix (soil/water):

SOIL/SEDIMENT

Lab Sample ID: 607620

Date Received: 12/11/02

Solids: 83.4

Level (low/med):

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	С	Q.	Ж
7439-97-6	Mercury	31.0			CV

Color Before:

Clarity Before:

Texture:

Color After:

Clarity After:

Artifacts:

Comments:

#### -2A-

# INITIAL AND CONTINUING CALIBRATION VERIFICATION

Contract: R2214662

⊐ab Code:

Case No.:

SAS No.:

SDG NO.: SP0023

Initial Calibration Source: PE PURE

Continuing Calibration Source: PE PURE

Concentration Units: ug/L

	Initial Ca	libration	Continuing Calibration					
Analyte	True	Found %R(1)	True	Found	%R(1)	Found	%R(1)	м
Mercury	3.0	3.07 102.3	3.0	3.08	102.7	2.7	8 92.7	cv

### -2A-

# INITIAL AND CONTINUING CALIBRATION VERIFICATION

ontract: R2214662

ab Code:

Case No.:

SAS No.:

SDG NO.: SP0023

nitial Calibration Source:

'ontinuing Calibration Source: PE PURE

Concentration Units: ug/L

	Initial	Calibration	Continuing Calibration					
Analyte	True	Found %R(1)	True	Found	%R(1)	Found	%R(1)	M
Mercury	1		3.0	3.10	103.3	3.1	2 104.0	cv

#### -2A-

# INITIAL AND CONTINUING CALIBRATION VERIFICATION

contract: R2214662

ab Code:

Case No.:

SAS No.:

SDG NO.: SP0023

mitial Calibration Source:

Jontinuing Calibration Source: PE PURE

Concentration Units: ug/L

	Initial	Calibration	Continuing Calibration					
Analyte	True	Found %R(1)	True	Found	%R(1)	Found	%R(1)	м
Mercury			3.0	3.05	101.7	_		CV

# -2A-

# INITIAL AND CONTINUING CALIBRATION VERIFICATION

Contract: R2214662

Lab Code:

Case No.:

SAS No.:

SDG NO.: SP0023

Initial Calibration Source: PE PURE

Continuing Calibration Source: PE PURE

Concentration Units: ug/L

	Initial Ca	libration	Continuing Calibration					
Analyte	True	Found %R(1)	True	Found	%R(1)	Found	%R(1)	M
Mercury	3.0	3.04 101.3	3.0	3.03	101.0	3.0	6 102.0	cv

#### -2A-

# INITIAL AND CONTINUING CALIBRATION VERIFICATION

contract: R2214662

rab Code:

Case No.:

SAS No.:

SDG NO.: SP0023

mitial Calibration Source:

Tontinuing Calibration Source: PE PURE

Concentration Units: ug/L

	Initial Calibration		Continuing Calibration					
Analyte	True	Found %R(1)	True	Found	%R(1)	Found	%R(1)	M
Mercury			3.0	3.09	103.0	3.1	2 104.0	CV

# -2A-

# INITIAL AND CONTINUING CALIBRATION VERIFICATION

Contract: R2214662

Lab Code:

Case No.:

SAS No.:

SDG NO.: SP0023

[nitial Calibration Source:

Continuing Calibration Source: PE PURE

Concentration Units: ug/L

	Initial	Calibration	Continuing Calibration					
Analyte	True	Found %R(1)	True	Found	%R(1)	Found	%R(1)	м
Mercury			3.0	3.10	103.3			CV

#### -2A-

# INITIAL AND CONTINUING CALIBRATION VERIFICATION

_>ntract: R2214662

_.b Code:

Case No.:

SAS No.:

SDG NO.: SP0023

_aitial Calibration Source: PE PURE

sontinuing Calibration Source: PE PURE

Concentration Units: ug/L

	Initial Ca	libration	Continuing Calibration					
Analyte	True	Found %R(1)	True	Found	%R(1)	Found	%R(1)	м
Mercury	3.0	3.15   105.0	3.0	3.13	104.3	3.1	2 104.0	cv

-2A-

# INITIAL AND CONTINUING CALIBRATION VERIFICATION

'ontract: R2214662

ab Code:

Case No.:

SAS No.:

SDG NO.: SP0023

nitial Calibration Source:

ontinuing Calibration Source: PE PURE

Concentration Units: ug/L

	Initial	Calibration	Continuing Calibration								
Analyte	True	Found %R(1)	True	Found	%R(1)	Found	%R(1)	м			
Mercury			3.0	3.19	106.3	3.1	8 106.0	cv			

#### -2A-

# INITIAL AND CONTINUING CALIBRATION VERIFICATION

_ontract: R2214662

_ab Code:

Case No.:

SAS No.:

SDG NO.: SP0023

_nitial Calibration Source:

continuing Calibration Source: PE PURE

Concentration Units: ug/L

	Initial	Calibration	Continuing Calibration							
Analyte	True	Found %R(1)	True	Found	%R(1)	Found	%R(1)	м		
Mercury	i l		3.0	3.20	106.7	3.2	2 107.3	cv		

⁽¹⁾ Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

#### -2A-

# INITIAL AND CONTINUING CALIBRATION VERIFICATION

Contract: R2214662

ab Code:

Case No.:

SAS No.:

SDG NO.: SP0023

initial Calibration Source: PE PURE

Continuing Calibration Source: PE PURE

Concentration Units: ug/L

	Initial Ca	libration	Continuing Calibration							
Analyte	True	Found %R(1)	True	Found	%R(1)	Found	%R(1)	N		
Mercury	3.0	3.12 104.0	3.0	3.13	104.3	3.1	1 103.7	CV		

# METALS -2B-

# CRDL STANDARD FOR AA AND ICP

ntract: R2214662

b Code:

Case No.:

CPI

SAS No.:

SDG No.: SP0023

CRDL Standard Source: CPI

_P CRDL Standard Source:

	CRDL Stand		In	CRDL Stan	dard fo	d for ICP Final		
Analyte	True	Found %R		True	Found	₹R	Found	%R
Mercury	0.2	0.20 100.0	Ī					

# METALS -2B-

# CRDL STANDARD FOR AA AND ICP

Contract: R2214662

Lab Code:

Case No.:

SAS No.:

SDG No.: SP0023

AA CRDL Standard Source: CPI

ICP CRDL Standard Source:

CPI

	CRDL Stand	dard for AA	In	CRDL Stan	dard f	for ICP Final		
Analyte	True	Found %R	True	Found	%R	Found	₹R	
Mercury	0.2	0.22 110.0	Ī			Ī	1	

# METALS -2B-

# CRDL STANDARD FOR AA AND ICP

ntract: R2214662

b Code:

Case No.:

SAS No.:

SDG No.: SP0023

CRDL Standard Source: CPI

_P CRDL Standard Source:

	CDDI. Stan	dard for AA		CRDL Standard for ICP						
	CRDI Stain	dalu loi AR	In:	itial	Final					
Analyte	True	Found %R	True	Found	%R	Found	₹R			
Mercury	0.2	0.21 105.0			1	1				

# METALS -2B-

# CRDL STANDARD FOR AA AND ICP

Contract: R2214662

Lab Code:

Case No.:

SAS No.:

SDG No.: SP0023

AA CRDL Standard Source: CPI

ICP CRDL Standard Source: CPI

	CRDL Stand	lard for AA		In	CRDL Stan	dard f	or ICP Final	
Analyte	True	Found %R		True	Found	%R	Found	%R
Mercury	0.2	0.22 110	.0					

Columbia Analytical Services

**METALS** 

-3-

**BLANKS** 

Contract: R2214662

wab Code:

Case No.:

SAS No.:

SDG NO.: SP0023

Preparation Blank Matrix (soil/water): SOIL

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Initial Calib. Blank		Continuing Calibration Blank (ug/L)						Preparation Blank			
Analyte	(ug/L)	С	1	C	2	C	3	c		C	М
Mercury	0.2	이미	0.20	ש	0.20	ש	0.20	ט	0.033	<b>ט</b>	CV

Columbia Analytical Services

**METALS** 

-3-

**BLANKS** 

Contract: R2214662

Lab Code:

Case No.:

SAS No.:

SDG NO.: SP0023

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Initial Calib. Blank			Cont	Preparation Blank								
Analyte	(ug/L)	С	1	C	2	С	3	_ c		C	[ [	m [
Mercury			0.2	ט ס	0.2	0 U						CV

olumbia Analytical Services

**METALS** 

-3-

BLANKS

Contract: R2214662

ab Code:

Case No.:

SAS No.:

SDG NO.: SP0023

reparation Blank Matrix (soil/water): SOIL

reparation Blank Concentration Units (ug/L or mg/kg): MG/KG

	Initial Calib. Blank			Con	tinuing Blank	Calibr	ation		Preparation Blank		
Analyte	(ug/L)	c	1	C	2	C	3	С		С	M
Mercury	0.2	20 U	0.2	20 σ	0.2	20   0	0.2	0 0	0.033	ט	cv

Columbia Analytical Services

**METALS** 

-3-

**BLANKS** 

Contract: R2214662

Lab Code:

Case No.:

SAS No.:

SDG NO.: SP0023

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

	Initial Calib. Blank		Continuing Calibration Blank (ug/L)						Preparation Blank		
Analyte	(ug/L)	С	1	C	2	С	3	С		c	М
Mercury			0.2	20 0	0.2	0 0					cv

-3-

**BLANKS** 

_ontract: R2214662

_ab Code:

Case No.:

SAS No.:

SDG NO.: SP0023

-reparation Blank Matrix (soil/water): SOIL

reparation Blank Concentration Units (ug/L or mg/kg): MG/KG

	Initial Calib. Blank				inuing Blank	Calibrate (ug/L)	ation		Preparation Blank		
Analyte	(ug/L)	С	1	C	2	C	3	c		c	М
Mercury	0.2	이 미	0.2	20 U	0.2	0 0	0.2	ס   ס	0.033	ס	CV

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**METALS** 

-3-

**BLANKS** 

ontract: R2214662

ab Code:

Case No.:

SAS No.:

SDG NO.: SP0023

reparation Blank Matrix (soil/water): WATER

reparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)			Cont	Preparation Blank						
		c	1	C	2	C	3	С		С	м
Mercury			0.20 σ		0.20   σ		0.20 U				

-3-

**BLANKS** 

ontract: R2214662

rab Code:

Case No.:

SAS No.:

SDG NO.: SP0023

Treparation Blank Matrix (soil/water): SOIL

reparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank			Con	Preparation Blank							
	(ug/L)	c	1	C	2	C	3	c	<u> </u>	C		M
Mercury	0.2	U  O	0.2	0   0	0.2	20 0			0.033	U	Π	cv

# METALS -5A-

### SPIKE SAMPLE RECOVERY

Sample 1	10.
----------	-----

SP0023S	
0100235	

ontract: R2214662

ab Code:

Case No.:

SAS No.:

SDG NO.: SP0023

atrix (soil/water):SOIL/SED

Level (low/med):

LOW

Solids for Sample: 87.1

3-2-1	Control	Spiked Sample		Sample		Spike		_		
Analyte	Limit %R	Result (SSR)	C	Result (SR)	C	Added	(SA)	₹R	Q	M
Mercury	75 - 125	0.5389		0.3317		1	0.18	115.5		CV

omments:	

Tolumbia Analytical Services	olum	hia 🗸	Anal	vtical	Service	S
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## **METALS**

#### -5A-

#### SPIKE SAMPLE RECOVERY

SAMPLE	NO.
--------	-----

ontract: R2214662

SP0043S

ab Code:

Case No.:

SAS No.:

SDG NO.: SP0023

atrix (soil/water):SOIL/SED

Level (low/med):

LOW

Solids for Sample: 83.9

Analyte	Control Limit %R	Spiked Sau   Result (Sa	•	Sample Result (SR)	C Added	(SA)	%R	Q	M
Mercury	ĺ		0.9244	0.7485		0.19	94.5		cv

ments:		 			
	_				
		 	<del></del>	 <del></del>	 <del></del>
	•	 		 	 

#### **METALS**

-6-

#### **DUPLICATES**

SAMPLE NO.

SP0023D

Contract: R2214662

Lab Code:

Case No.:

SAS No.:

SDG NO.: SP0023

Matrix (soil/water): SOIL/SEDI

Level (low/med):

LOW

% Solids for Sample: 87.1

% Solids for Duplicate: 87.1

Concentration Units (ug/L or mg/kg dry weight):

MG/KG

Analyte	Control   Limit	Sample (S)	С	Duplicate	(D) C	RPD	Q	M
Mercury		0.	3317		0.3203	3.5		CV

Jumbia Analytical Services

**METALS** 

-6-

**DUPLICATES** 

SAMPLE NO.

SP0043D

ntract: R2214662

_b Code:

Case No.:

SAS No.:

SDG NO.: SP0023

_.trix (soil/water): SOIL/SEDI

Level (low/med):

LOW

~ Solids for Sample: 83.9

% Solids for Duplicate: 83.9

Analyte	Control Limit	Sample (S)	С	Duplicate	(D) C	RPD	Q	м
Mercury			0.7485	]	0.7320	2.2		CV

### **METALS**

-7-

### LABORATORY CONTROL SAMPLE

Contract: R2214662

ab Code:

Case No.:

SAS No.:

SDG NO.: SP0023

Solid LCS Source: ERA

queous LCS Source:

	Aqueous	(ug/L)		Solid (mg/kg)				
Analyte	True	Found	%R	True	Found C	Limits	₹R	
Mercury				1.5	1.4	0.9	2.1 94.2	

### **METALS**

-7-

## LABORATORY CONTROL SAMPLE

ontract: R2214662
ab Code: Case No.: SAS No.: SDG N

SDG NO.: SP0023

'olid LCS Source: ERA

queous LCS Source:

	Aqueous (ug/L)			Solid (mg/kg)			
Analyte	True	Found	%R	True	Found C	Limits	%R
Mercury				1.5	1.3	0.9	2.1 86.6

Jolumbia Analytical Services

#### **METALS**

7-

## LABORATORY CONTROL SAMPLE

!ontract: R2214662

ab Code:

Case No.:

SAS No.:

SDG NO.: SP0023

lolid LCS Source:ERA

queous LCS Source:

	Aqueous	ug/L)		Solid (mg/kg)			
Analyte	True	Found	%R	True	Found C	Limits	%R
Mercury				1.5	1.4	0.9	2.1 93.2

### **METALS**

-7-

## LABORATORY CONTROL SAMPLE

ontract: R2214662

ab Code:

Case No.:

SAS No.:

SDG NO.: SP0023

olid LCS Source: ERA

'queous LCS Source:

	Aqueous	(ug/L)		Solid (mg/kg)			
Analyte	True	Found	%R	True	Found C	Limits	%R
Mercury	i <u> </u>			1.5	1.3	0.9	2.1 87.2



OCT 1 8 2002

At Expension



STL Buffalo

10 Hazelwood Drive Suite 106 Amherst, NY 14228

Tel: 716 691 2600 Fax: 716 691 7991 www.stl-inc.com

ANALYTICAL REPORT

Job#: <u>A02-9633</u>

STL Project#: NY2A8971

Site Name: Exponent, Inc.

Task: Exponent, Inc. - Woodridge Site

Mr. David Lamadrid Exponent, Inc. 4000 Kruse Way, Bldg 2, Ste 285 Lake Oswego, OR 98035

CC: Elizabeth A. Henry, Ph.D.

STL Buffalo

Brian J. Fischer Project Manager

Susan L. Mazur Laboratory Director

10/16/2002

This report contains  $40^{-2}$  pages which are individually numbered.

SAMPLE DATA SUMMARY PACKAGE

### SAMPLE SUMMARY

		SAMPLE	)	RECEIVE	<b>3</b> D
LAB SAMPLE ID	CLIENT SAMPLE ID	DATE	TIME	DATE	TIME_
A2963301	GW0301	09/24/2002	12:20	09/28/2002	09:30
A2963302	GW0302	• •		09/28/2002	
A2963303	GW0303			09/28/2002	
A2963304	GW0304			09/28/2002	
A2963305	GW0305			09/28/2002	
A2963306	GW0306			09/28/2002	
A2963307	GW0307			09/28/2002	
A2963308	GW0308			09/28/2002	
A2963309	GW0309			09/28/2002	
A2963310	GW0310			09/28/2002	
A2963311	GW0311			09/28/2002	
A2963312	GW0312			09/28/2002	
A2963313	GW0313			09/28/2002	
A2963313MS	GW0313 MS			09/28/2002	
A2963313SD	GW0313 SD			09/28/2002	
A2963314	GW0314			09/28/2002	
A2963315	GW0315			09/28/2002	
A2963316	GW0316			09/28/2002	
A2963317	GW0317	09/27/2002	13:15	09/28/2002	09:30

#### METHODS SUMMARY

Job#: <u>A02-9633</u>

STL Project#: NY2A8971

Site Name: Exponent, Inc.

ANALYTICAL
METHOD
SW8463 6020
SW8463 6020
SW8463 6020

### References:

SW8463

"Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW846), Third Edition, 9/86; Update I, 7/92; Update IIA, 8/93; Update II, 9/94; Update IIB, 1/95; Update III, 12/96.

#### NON-CONFORMANCE SUMMARY

Job#: A02-9633

STL Project#: NY2A8971

Site Name: Exponent, Inc.

#### General Comments

The enclosed data have been reported utilizing data qualifiers (Q) as defined on the Data Comment Page.

Soil, sediment and sludge sample results are reported on "dry weight" basis unless otherwise noted in this data package.

According to 40CFR Part 136.3, pH, Chlorine Residual and Dissolved Oxygen analyses are to be performed immediately after aqueous sample collection. When these parameters are not indicated as field (e.g. pH-Field), they were not analyzed immediately, but as soon as possible after laboratory receipt.

Sample dilutions were performed as indicated on the attached Dilution Log. The rationale for dilution is specified by the 3-digit code and definition.

#### Sample Receipt Comments

#### A02-9633

Sample Cooler(s) were received at the following temperature(s); 4 °C All samples were received in good condition.

#### Metals Data

No deviations from protocol were encountered during the analytical procedures.



*****

The results presented in this report relate only to the analytical testing and condition of the sample at receipt. This report pertains to only those samples actually tested. All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.

"I certify that this package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package and electronic deliverable has been authorized by the Laboratory Director or her designee, as verified by the following signature."

Susan L. Mazur

Laboratory Director

10/16/02

Date

### **DATA COMMENT PAGE**

#### **ORGANIC DATA QUALIFIERS**

ND or U Indicates compound was analyzed for, but not detected.

- J Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the data indicates the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.
- C This flag applies to pesticide results where the identification has been confirmed by GC/MS.
- B This flag is used when the analyte is found in the associated blank, as well as in the sample.
- E This flag identifies compounds whose concentrations exceed the calibration range of the instrument for that specific analysis.
- D This flag identifies all compounds identified in an analysis at the secondary dilution factor.
- N Indicates presumptive evidence of a compound. This flag is used only for tentatively identified compounds, where the identification is based on the Mass Spectral library search. It is applied to all TIC results.
- P This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns. The lower of the two values is reported on the data page and flagged with a "P".
- A This flag indicates that a TIC is a suspected aldol-condensation product.
- ¹ Indicates coelution.
- Indicates analysis is not within the quality control limits.

#### **INORGANIC DATA QUALIFIERS**

ND or U Indicates element was analyzed for, but not detected. Report with the detection limit value.

- J or B Indicates a value greater than or equal to the instrument detection limit, but less than the quantitation limit.
- N Indicates spike sample recovery is not within the quality control limits.
- K Indicates the post digestion spike recovery is not within the quality control limits.
- S Indicates value determined by the Method of Standard Addition.
- M Indicates duplicate injection results exceeded quality control limits.
- W Post digestion spike for Furnace AA analysis is out of quality control limits (85-115%) while sample absorbance is less than 50% of spike absorbance.
- E Indicates a value estimated or not reported due to the presence of interferences.
- H Indicates analytical holding time exceedance. The value obtained should be considered an estimate.
- Indicates analysis is not within the quality control limits.
- + Indicates the correlation coefficient for the Method of Standard Addition is less than 0.995.

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### **INORGANIC ANALYSIS DATA SHEET**

SAMPLE	NO.
--------	-----

- 1	-	 	 -
i	GW0301		

_ontract: NY02-258

_ab Code: STLNY

Case No.:

SAS No.:

SDG NO.: A02-9633

watrix (soil/water): WATER

Lab Sample ID: AD229954

Level (low/med):

LOW

Date Received: 9/28/02

CAS No.	Analyte	Concentration	C	Q	М
7440-38-2	Arsenic	2.230	1		М
7440-43-9	Cadmium	0.5000	טן		М
7440-28-0	Thallium	0.2000	טן		М

Color Before:	COLORLESS	Clarity Before:	CLEAR	Texture:	NONE
Color After:	COLORLESS	Clarity After:	CLR/FIL	Artifacts:	
Comments:					
<del></del> -					· · · · · · · · · · · · · · · · · · ·

-1-

#### **INORGANIC ANALYSIS DATA SHEET**

000008

SAMPLE NO.

GW0302		

Contract: NY02-258

Lab Code: STLNY

Case No.:

SAS No.:

SDG NO.: A02-9633

Matrix (soil/water):

WATER

Lab Sample ID: AD229955

Level (low/med):

LOW

Date Received: 9/28/02

CAS No.	Analyte	Concentration	C	Q	м
7440-38-2	Arsenic	3.210	+		м
7440-43-9	Cadmium	0.5000	ש		М
7440-28-0	Thallium	0.2000	ט	1	М

Color Bef	ore:	YELLOW	Clarity Before:	CLEAR	Texture:	NONE
Color Aft	er:	COLORLESS	Clarity After:	CLR/FIL	Artifacts:	
Comments:						

## 000009

#### INORGANIC ANALYSIS DATA SHEET

SAMPLE	NO	
--------	----	--

GW0303		
GMU3U3		

⊷ntract: NY02-258

LD Code: STLNY

Ævel (low/med):

Case No.:

SAS No.:

SDG NO.: A02-9633

matrix (soil/water):

WATER

LOW

Lab Sample ID: AD229956

Date Received: 9/28/02

CAS No.	Analyte	Concentration	c	Q	м
7440-38-2	Arsenic	3.010			М
7440-43-9	Cadmium	0.5000	ט		M
7440-28-0	Thallium	0.2000	ט		М

Color Before:	YELLOW	Clarity Before:	CLEAR	Texture:	NONE
Color After:	COLORLESS	Clarity After:	CLR/FIL	Artifacts:	
-Comments:				_	
_	<del></del>	·········	<del></del>		

#### -1-**INORGANIC ANALYSIS DATA SHEET**

000010

SAMPLE NO.

GW0304		

Contract: NY02-258

ab Code: STLNY

Case No.:

SAS No.:

SDG NO.: A02-9633

latrix (soil/water):

WATER

Lab Sample ID: AD229957

evel (low/med):

Date Received: 9/28/02

Concentration Units (ug/L or mg/kg dry weight):

UG/L

CAS No.	Analyte	Concentration	c	Q	М
7440-38-2	Arsenic	6.670	+		М
7440-43-9	Cadmium	0.5000	ט		M
7440-28-0	Thallium	0.2973	ī	i	M

Color Before:	YELLOW	Clarity Before:	CLEAR	Texture:	NONE
Color After:	YELLOW	Clarity After:	CLR/FIL	Artifacts:	
Comments:					
<del></del>					

## **INORGANIC ANALYSIS DATA SHEET**

SAMPLE	NO.	 
GW0305		

000011

ontract: NY02-258

ib Code: STLNY

Case No.:

SAS No.:

SDG NO.: A02-9633

_atrix (soil/water):

WATER

Lab Sample ID: AD229958

_evel (low/med):

LOW

Date Received: 9/28/02

CAS No.	Analyte	Concentration	c	Q	М
7440-38-2	Arsenic	2.820		-	M
7440-43-9	Cadmium	0.5000	טן	1	M
7440-28-0	Thallium	0.2000	ט		M

Color Before: YE	LLOW Clar	ity Before:	CLEAR	Texture:	NONE
Color After: CO	LORLESS Clar	ity After:	CLR/FIL	Artifacts:	
Comments:				·	

-1-

## 000012

#### **INORGANIC ANALYSIS DATA SHEET**

SAMPLE NO. GW0306

Contract: NY02-258

ab Code: STLNY

Case No.:

SAS No.:

SDG NO.:

A02-9633

fatrix (soil/water):

WATER

Lab Sample ID: AD229959

Level (low/med):

LOW

Date Received: 9/28/02

Concentration Units (ug/L or mg/kg dry weight):

UG/L

CAS No.	Analyte	Concentration	С	0	м
7440-38-2	Arsenic	2.520	1		м
7440-43-9	Cadmium	0.5000	טן		M
7440-28-0	Thallium	0.2000	טן		M

Color Before:	YELLOW	Clarity Before:	CLEAR	Texture:	NONE
Color After:	COLORLESS	Clarity After:	CLR/FIL	Artifacts:	
Comments:					

#### -1-**INORGANIC ANALYSIS DATA SHEET**

$\boldsymbol{\Lambda}$	$\sim$	$\langle \rangle$	3.1	7	7
U	U	v	U		J

Concentration Units (ug/L or mg/kg dry weight):

SAMPLE	NO.	
GW0307		

ontract: NY02-258

ab Code: STLNY

Case No.:

SAS No.:

SDG NO.: A02-9633

WATER _atrix (soil/water):

Lab Sample ID: AD229960

UG/L

_evel (low/med):

LOW

Date Received: 9/28/02

CAS No.	Analyte	Concentration	c	Q	м
7440-38-2	Arsenic	3.250	1 1		м
7440-43-9	Cadmium	0.5000	ן טן		M
7440-28-0	Thallium	0.2000	ט		M

Color Before:	YELLOW	Clarity Before:	CLEAR	Texture:	NONE
Color After:	COLORLESS	Clarity After:	CLR/FIL	Artifacts:	
Comments:					
. <u></u>					

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000014

## INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

GW0308	 	
<u>.</u>		

Contract: NY02-258

Lab Code: STLNY

Case No.:

SAS No.:

SDG NO.: A02-9633

Matrix (soil/water):

WATER

Lab Sample ID: AD229961

Level (low/med):

LOW

Date Received: 9/28/02

CAS No.	Analyte	Concentration	С	Q	м
7440-38-2	Arsenic	1.990			М
7440-43-9	Cadmium	0.5000	שן		M
7440-28-0	Thallium	0.2000	ט		М

Color	Before:	COLORLESS	Clarity Before:	CLEAR	Texture:	NONE
Color	After:	COLORLESS	Clarity After:	CLR/FIL	Artifacts:	
Commen	ts:					

#### -1-

### **INORGANIC ANALYSIS DATA SHEET**

000015

SAMPLE NO.

GW0309	 	

ntract: NY02-258

b Code: STLNY

Case No.:

SAS No.:

SDG NO.: A02-9633

trix (soil/water): WATER

Lab Sample ID: AD229962

wel (low/med):

LOW

Date Received: 9/28/02

CAS No.	Analyte	Concentration	С	Q	м
7440-38-2	Arsenic	4.420	1_		м
7440-43-9	Cadmium	0.5000	ש		М
7440-28-0	Thallium	0.2000	ט		М

Color Before:	YELLOW	Clarity Before:	CLEAR	Texture:	NONE
Color After:	COLORLESS	Clarity After:	CLR/FIL	Artifacts:	
_					

#### **INORGANIC ANALYSIS DATA SHEET**

SAMPLE	NO.

nan	21	Λ	

Contract: NY02-258

Lab Code: STLNY

Case No.:

SAS No.:

SDG NO.:

A02-9633

Matrix (soil/water):

WATER

Lab Sample ID: AD229963

Level (low/med):

LOW

Date Received: 9/28/02

CAS No.	Analyte	Concentration	C	Q	м
7440-38-2	Arsenic	12.2		<u> </u>	м
7440-43-9	Cadmium	0.5000	U		М
7440-28-0	Thallium	0.2000	ט	1	М

Color	Before:	YELLOW	Clarity Before:	CLEAR	Texture:	NONE
Color	After:	COLORLESS	Clarity After:	CLR/FIL	Artifacts:	
Commen	ts:					
				<del>-</del> -		

### **INORGANIC ANALYSIS DATA SHEET**

SAMPLE NO.	
GW0311	<u> </u>

_ontract: NY02-258

Case No.:

SAS No.:

SDG NO.: A02-9633

Latrix (soil/water): WATER

Lab Sample ID: AD229964

wevel (low/med):

LOW

Date Received: 9/28/02

CAS No.	Analyte	Concentration	c	Q	м
7440-38-2	Arsenic	3.550	1		М
7440-43-9	Cadmium	0.8312			M
7440-28-0	Thallium	0.2000	ן ט		М

Color Before	COLORLESS	Clarity Before:	CLEAR	Texture:	NONE
Color After:	COLORLESS	Clarity After:	CLR/FIL	Artifacts:	
_Comments:					
_					

### **INORGANIC ANALYSIS DATA SHEET**

SAMPLE	NO.
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Contract: NY02-258

Lab Code: STLNY

Case No.:

SAS No.:

SDG NO.: A02-9633

Matrix (soil/water):

WATER

Lab Sample ID: AD229965

Level (low/med):

LOW

Date Received: 9/28/02

CAS No.	Analyte	Concentration	C	Q	м
7440-38-2	Arsenic	3.330			М
7440-43-9	Cadmium	0.8508			M
7440-28-0	Thallium	0.2000	ן ט		М

Color Bef	ore: COLORL	ESS Clarity	Before: 0	CLEAR	Texture:	NONE
Color Afte	er: COLORL	ESS Clarity	After: C	CLR/FIL	Artifacts:	
Comments:						
	<del></del>		- · · · · · · · · · · · · · · · · · · ·			

-1-

### **INORGANIC ANALYSIS DATA SHEET**

SAMPLE :	NO.
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GW0313

_ntract: NY02-258

ib Code: STLNY

Case No.:

SAS No.:

SDG NO.: A02-9633

_atrix (soil/water): WATER

Lab Sample ID: AD229966

wevel (low/med): LOW

Date Received: 9/28/02

CAS No.	Analyte	Concentration	c	Q	м
7440-38-2	Arsenic	4.890	1 1		м
7440-43-9	Cadmium	0.5000	ן ט		M
7440-28-0	Thallium	0.2000	ט		M

Color Before:	YELLOW	Clarity Before:	CLEAR	Texture:	NONE
Color After:	YELLOW	Clarity After:	CLR/FIL	Artifacts:	
_ Comments:					

**INORGANIC ANALYSIS DATA SHEET** 

SAMPLE	NO.
GW0314	

Contract: NY02-258

ab Code: STLNY

Case No.:

SAS No.:

SDG NO.: A02-9633

(atrix (soil/water):

WATER

Lab Sample ID: AD229969

evel (low/med):

LOW

Date Received: 9/28/02

CAS No.	Analyte	Concentration	С	Q	м
7440-38-2	Arsenic	41.5	$\dagger$	1	М
7440-43-9	Cadmium	0.5000	שן	Ï	M
7440-28-0	Thallium	0.2000	ט		M

Color Before	YELLOW	Clarity Before:	CLEAR	Texture:	NONE
Color After:	COLORLESS	Clarity After:	CLR/FIL	Artifacts:	
Comments:					

## **INORGANIC ANALYSIS DATA SHEET**

SAMPLE	NO.	
GW0315		

_ntract: NY02-258

_ab Code: STLNY

revel (low/med):

Case No.:

SAS No.:

SDG NO.: A02-9633

matrix (soil/water): WATER

LOW

Lab Sample ID: AD229970

Date Received: 9/28/02

CAS No.	Analyte	Concentration	С	Q	м
7440-38-2	Arsenic	2.900	1		М
7440-43-9	Cadmium	0.5000	ן ט		М
7440-28-0	Thallium	0.2000	ן ט		M

Color Before:	COLORLESS	Clarity Before:	CLEAR	Texture:	NONE
Color After:	COLORLESS	Clarity After:	CLR/FIL	Artifacts:	
Comments:					

-1-

### **INORGANIC ANALYSIS DATA SHEET**

CA	M	T 127	NO.
34	MLP.	-	NU.

GW0316	
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Contract: NY02-258

Lab Code: STLNY

Case No.:

SAS No.:

SDG NO.: A02-9633

Matrix (soil/water):

WATER

Lab Sample ID: AD229971

Level (low/med):

LOW

Date Received: 9/28/02

CAS No.	Analyte	Concentration	c	٥	м
7440-38-2	Arsenic	2.830	+		М
7440-43-9	Cadmium	0.5000	ט		М
7440-28-0	Thallium	0.2000	ט		М

Color B	efore:	COLORLESS	Clarity Before:	CLEAR	Texture:	NONE
Color A	fter:	COLORLESS	Clarity After:	CLR/FIL	Artifacts:	
Comment.	s:				_	
	-		<u> </u>			

#### -1-INORGANIC ANALYSIS DATA SHEET

	SAMPLE	NO.
-		

GW0317

untract: NY02-258

_ab Code: STLNY

Case No.:

SAS No.:

SDG NO.: A02-9633

matrix (soil/water): WATER

Lab Sample ID: AD229972

mevel (low/med):

Date Received: 9/28/02

CAS No.	Analyte	Concentration	С	Q	М
7440-38-2	Arsenic	10.9	† †	<del></del>	М
7440-43-9	Cadmium	0.5000	ט		M
7440-28-0	Thallium	0.2000	ן טן		М

Color Before	COLORLESS	Clarity Before:	CLEAR	Texture:	NONE
Color After:	COLORLESS	Clarity After:	CLR/FIL	Artifacts:	
_Comments: _					

-5A-

#### SPIKE SAMPLE RECOVERY

SAMPLE NO.

GW0313	MS		

Contract: NY02-258

ab Code: STLNY

Case No.:

SAS No.:

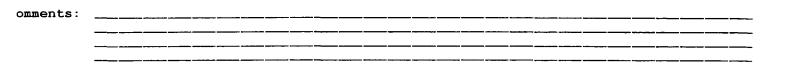
SDG NO.: A02-9633

fatrix (soil/water): WATER

Level (low/med):

Solids for Sample: 0.0

Analyte	Control Limit %R	Spiked Sample Result (SSR) C	Sample Result (SR) C	Spike Added (SA)	%R Ç	M
Arsenic	75 - 125	26.8151	4.8893	20.00	110	М
Cadmium	75 - 125	21.6648	0.5000 ป	20.00	108	М
Thallium	75 - 125	20.5875	0.2000 U	20.00	103	М



### -5A-

### SPIKE SAMPLE RECOVERY

-				SAMPLE NO.		
-					GW0313 SD	
_ntract:	NY02-258					
.b Code:	STLNY	Case No.:	SAS No.:		SDG NO.:	A02-9633
_trix (so	oil/water):	WATER	<del></del>	Level	(low/med):	LOW
Solids f	for Sample:	0.0				

Analyte	Control Limit %R	Spiked Sample Result (SSR)	Sample Result (SR) C	Spike Added (SA)	₽R	Q	М
Arsenic	75 - 125	25.8377	4.8893	20.00	105		М
Cadmium	75 - 125	21.4163	0.5000 U	20.00	107		М
Thallium	75 - 125	20.3189	0.2000   บ	20.00	102		М

# EXPONENT, INC. -5B-

#### POST DIGEST SPIKE SAMPLE RECOVERY

SAMPLE NO.

GW0313	A			

Contract: NY02-258

Lab Code: STLNY

Case No.:

SAS No.:

SDG NO.: A02-9633

Level (low/med):

_____

LOW

Matrix (soil/water): WATER

Concentration Units: ug/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	Sample Result (SR) C	Spike Added(SA)	%R	Ω	м
Arsenic		26.8794	4.8893	20.00	110.0		м
Cadmium	1	22.1285	0.5000 บ	20.00	110.6		м
Thallium	1	20.6224	0.2000 บ	20.00	103.1		м

Comments:

'TL BUFFA
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## **DUPLICATES**

SAMPLE N	Ю.

GW0313	SD		

_ontract: NY02-258

_ ib Code: STLNY

Case No.:____

SAS No.:

SDG NO.: A02-9633

_strix (soil/water): WATER

Level (low/med):

LOW

Solids for Sample: 0.0

% Solids for Duplicate:

0.0

Concentration Units (ug/L or mg/kg dry weight):

UG/L

Analyte	Control	Sample (S) C	Duplicate (D) C	RPD	Q/	м
Arsenic	ĺ	26.8151	25.8377	3.7		М
Cadmium	1	21.6648	21.4163	1.2	J	М
Thallium	1	20.5875	20.3189	1.3		М

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EXPONENT, INC.

-3-

#### **BLANKS**

Contract:	NY02-258

Lab Code: STLNY

Case No.:

SAS No.:

SDG NO.: A02-9633

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

	Initial Calib. Blank			Continuing Calibration Blank (ug/L)					Preparation Blank			
Analyte	(ug/L)	c	1	С	2	C	3	С		С	П	M
Arsenic	1.0000	ן ט	1.0000	וט	1.0000	ן ט	1.0000	<b>ט</b>	1.0000	U	<u> </u>	M
Cadmium	0.5000	ט	0.5000	ט	0.5000	ט	0.5000	ט	0.5000	U	ij	M
Thallium	0.2000	ַ ט	0.2000	ט	0.2000	ן ט	0.2000	Ū	0.2000	Ū	ij	M

TL	BU	$J\mathbf{F}$	$F_{A}$	11	LO
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# EXPONENT, INC.

-3-

# **BLANKS**

ontract:	NY02-258			
Jab Code:	STLNY	Case No.:	SAS No.:	SDG NO.: A02-9633
>-eparatio	n Blank M	atrix (soil/water): \frac{W}{2}	ATER	
`-eparatio	n Blank C	oncentration Units (	ug/L or mg/kg): UG/L	

	Initial Calib. Blank		-	Con	tinuing Blank	Calibr	ation		Preparation Blank			
Analyte	(ug/L)	С	1	С	2	С	3	c	Brank	С	М	i
Arsenic			1.000	이미							M	ī
Cadmium		11	0.500	0 0		İ		i I	ĺ	Ì	M	7
Thallium	1	T I	0.200	0 0		ĪĪ	· -				M	ī

SAMPLE DATA PACKAGE

**SDG NARRATIVE** 

# SAMPLE SUMMARY

		SAMPLET	)	RECEIVE	<b>D</b>
LAB SAMPLE ID	CLIENT SAMPLE ID	DATE	TIME	DATE	TIME
A2963301	GW0301	09/24/2002	12:20	09/28/2002	09:30
A2963302	GW0302	09/24/2002	17:20	09/28/2002	09:30
A2963303	GW0303	09/25/2002	10:00	09/28/2002	09:30
A2963304	GW0304			09/28/2002	
A2963305	GW0305	09/25/2002			
A2963306	GW0306	09/25/2002	17:20	09/28/2002	09:30
A2963307	GW0307	09/25/2002		•	
A2963308	GW0308	09/26/2002			
A2963309	GW0309	09/26/2002			
A2963310	GW0310	09/26/2002		•	
A2963311	GW0311	09/26/2002			
A2963312	GW0312	09/26/2002			
A2963313	GW0313	09/26/2002			
A2963313MS	GW0313 MS	09/26/2002			
A2963313SD	GW0313 SD	09/26/2002			
A2963314	GW0314	09/26/2002			
A2963315	GW0315	09/27/2002		• •	
A2963316	GW0316	09/27/2002			
A2963317	GW0317	09/27/2002	13:15	09/28/2002	09:30

### METHODS SUMMARY

Job#: <u>A02-9633</u>

STL Project#: NY2A8971

Site Name: Exponent, Inc.

	ANALYTICAL
PARAMETER	METHOD
Arsenic - Total	SW8463 6020
Cadmium - Total	SW8463 6020
Thallium - Total	SW8463 6020

# References:

SW8463

"Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW846), Third Edition, 9/86; Update I, 7/92; Update IIA, 8/93; Update II, 9/94; Update IIB, 1/95; Update III, 12/96.

#### NON-CONFORMANCE SUMMARY

Job#: A02-9633

STL Project#: NY2A8971

Site Name: Exponent, Inc.

#### General Comments

The enclosed data have been reported utilizing data qualifiers (Q) as defined on the Data Comment Page.

Soil, sediment and sludge sample results are reported on "dry weight" basis unless otherwise noted in this data package.

According to 40CFR Part 136.3, pH, Chlorine Residual and Dissolved Oxygen analyses are to be performed immediately after aqueous sample collection. When these parameters are not indicated as field (e.g. pH-Field), they were not analyzed immediately, but as soon as possible after laboratory receipt.

Sample dilutions were performed as indicated on the attached Dilution Log. The rationale for dilution is specified by the 3-digit code and definition.

# Sample Receipt Comments

#### A02-9633

Sample Cooler(s) were received at the following temperature(s); 4 °C All samples were received in good condition.

#### Metals Data

No deviations from protocol were encountered during the analytical procedures.



*****

The results presented in this report relate only to the analytical testing and condition of the sample at receipt. This report pertains to only those samples actually tested. All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.

"I certify that this package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package and electronic deliverable has been authorized by the Laboratory Director or her designee, as verified by the following signature."

Susan L. Mazur

Laboratory Director

Date

CHAIN OF CUSTODY DOCUMENTATION

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**METALS DATA** 

# **COVER PAGE - INORGANIC ANALYSIS DATA PACKAGE**

ontract:	NY02-	-258			SDG No.:	A02-9633
ab Code:	STLNY	Case No.:			SAS No.:	
OW No.:	SW8463	3RD ED		*		
		Sample ID.	Lal	Sample No.		
		GW0301	<u></u>	963301		
		GW0302		963302	-	
		GW0303		963303	_	
		GW0304		963304	-	
		GW0305		963305	-	
		GW0306		963306	-	
		GW0307		963307	_	
		GW0308		963308	-	
		GW0309		963309	-	
		GW0310		963310	-	
		GW0311		963310	-	
		GW0312			-	
		GW0312		963312 963313	-	
		GW0313 MS			-	
		GW0313 ND		963313S	-	
		GW0314		063313SD	•	
		GW0315		963314 963315	-	
		G#0313	<u>AZ</u>	.03313	-	
Were ICP	backgro	ement corrections applied?  ound corrections applied?  e raw data generated before  n of background corrections?	,		Yes/No Yes/No Yes/No	YES
comments	:					
						<del></del>
ontract, bove. R	both telease	his data package is in complechnically and for completer of the data contained in this e data submitted on floppy canager's designee, as verifi	ness, for is hardcop liskette h	other than the cond y data package and as been authorized	ditions of in the by the D	detailed
ignature:	<u>S</u>	wat man	Name:	Susan L. Mazur		<del></del>
ite:	<del></del>	19/16/02	Title:	Laboratory Directo	or	

	COVER PAGE - INORGAI	NIC ANAL	YSIS DATA PACI	KAGE	
Contract: NY02-258			<u></u>	SDG No.:	A02-9633
'ab Code: STLNY	Case No.:			SAS No.:	
DW No.: SW8463 3RD EI	2				
Sampl	e ID.	Lai	o Sample No.		
	 L6	A2	963316		
GW031			963317		
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Were ICP interelement	corrections applied?			Yes/No	YES
Yere ICP background co	orrections applied?			Yes/No	YES
<del>-</del>	lata generated before			/	
application of be	ackground corrections?			Yes/No	NO
-					
.omments:					
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contract, both technic bove. Release of the computer-readable data	ta package is in completent ally and for completent data contained in this submitted on floppy distributed as verified.	ess, for hardcop iskette h	other than the by data package as been author:	conditions and in the ized by the	detailed
ignature:	man	Name:	Susan L. Mazu:	r	
ate:	19/19/03	Title:	Laboratory Dis	rector	

COVER PAGE - IN

-1-

# INORGANIC ANALYSIS DATA SHEET

SAMPLE	NO.	
GW0301	<u> </u>	

Contract: NY02-258

ab Code: STLNY

evel (low/med):

Case No.:

LOW

SAS No.:

SDG NO.: A02-9633

latrix (soil/water):

WATER

Lab Sample ID: AD229954

Date Received: 9/28/02

CAS No.	Analyte	Concentration	c	Q	м
7440-38-2	Arsenic	2.230	1		м
7440-43-9	Cadmium	0.5000	ע		М
7440-28-0	Thallium	0.2000	ט		М

Color Before:	COLORLESS	Clarity Before:	CLEAR	Texture:	NONE
Color After:	COLORLESS	Clarity After:	CLR/FIL	Artifacts:	
Comments:					

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000002

### INORGANIC ANALYSIS DATA SHEET

S 2	ΔMI	3.TC	NO	

GW0302		

_ontract: NY02-258

_ıb Code: STLNY

Case No.:

SAS No.:

SDG NO.: A02-9633

_atrix (soil/water): WATER

Lab Sample ID: AD229955

Date Received: 9/28/02

wevel (low/med): LOW

CAS No.	Analyte	Concentration	С	Q	м
7440-38-2	Arsenic	3.210	1		М
7440-43-9	Cadmium	0.5000	ש		М
7440-28-0	Thallium	0.2000	ט		М

Color Before:	YELLOW	Clarity Before:	CLEAR	Texture:	NONE
Color After:	COLORLESS	Clarity After:	CLR/FIL	Artifacts:	
_Comments: _					
_					

# **INORGANIC ANALYSIS DATA SHEET**

SAMPLE	NO.

Contract: NY02-258

ab Code: STLNY

Case No.:

SAS No.:

SDG NO.:

A02-9633

fatrix (soil/water):

WATER

Lab Sample ID: AD229956

.evel (low/med):

LOW

Date Received: 9/28/02

CAS No.	Analyte	Concentration	С	Q	М
7440-38-2	Arsenic	3.010			м
7440-43-9	Cadmium	0.5000	ט		М
7440-28-0	Thallium	0.2000	ט		м

Color Be	efore:	YELLOW	Clarity Before:	CLEAR	Texture:	NONE
Color Af	ter:	COLORLESS	Clarity After:	CLR/FIL	Artifacts:	
Comments	s:					
				<del></del>		

### -1-**INORGANIC ANALYSIS DATA SHEET**

SAMPLE	NO.	
GW0304		

ntract:	NY02-258
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ے Code: STLNY

Case No.:

SAS No.:

SDG NO.: A02-9633

mtrix (soil/water):

WATER

Lab Sample ID: AD229957

evel (low/med):

LOW

Date Received: 9/28/02

CAS No.	Analyte	Concentration	С	Q	М
7440-38-2	Arsenic	6.670			М
7440-43-9	Cadmium	0.5000	ט	1	М
7440-28-0	Thallium	0.2973			М

Color Before:	YELLOW	Clarity Before:	CLEAR	Texture:	NONE
Color After:	YELLOW	Clarity After:	CLR/FIL	Artifacts:	
	,				

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# **INORGANIC ANALYSIS DATA SHEET**

SAMPLE	NO.

GW030	5	- <u>-</u>	

ontract: NY02-258

ab Code: STLNY

Case No.:

SAS No.:

SDG NO.:

A02-9633

atrix (soil/water):

WATER

Lab Sample ID: AD229958

evel (low/med):

LOW

Date Received: 9/28/02

CAS No.	Analyte	Concentration	c	Q	м
7440-38-2	Arsenic	2.820		_	М
7440-43-9	Cadmium	0.5000	ט		М
7440-28-0	Thallium	0.2000	ט		М

Color	Before:	YELLOW	Clarity Before:	CLEAR	Texture:	NONE
Color	After:	COLORLESS	Clarity After:	CLR/FIL	Artifacts:	
Commen	ts:					

#### -1-

# **INORGANIC ANALYSIS DATA SHEET**

SAMPLE	NO.	
GW0306		

_ntract: NY02-258

_b Code: STLNY

Case No.:

SAS No.:

SDG NO.: A02-9633

atrix (soil/water):

WATER

Lab Sample ID: AD229959

wevel (low/med):

LOW

Date Received: 9/28/02

CAS No.	Analyte	Concentration	С	Q	М
7440-38-2	Arsenic	2.520	+		м
7440-43-9	Cadmium	0.5000	ט	1	М
7440-28-0	Thallium	0.2000	ט		М

Color Before:	YELLOW	Clarity Before:	CLEAR	Texture:	NONE
Color After:	COLORLESS	Clarity After:	CLR/FIL	Artifacts:	

# **INORGANIC ANALYSIS DATA SHEET**

SAMPLE	NO.	
-		
GW0307		

Contract: NY02-258

Lab Code: STLNY

Case No.:

SAS No.:

SDG NO.:

A02-9633

fatrix (soil/water):

WATER

Lab Sample ID: AD229960

Level (low/med):

Date Received: 9/28/02

CAS No.	Analyte	Concentration	С	Q	м
7440-38-2	Arsenic	3.250			М
7440-43-9	Cadmium	0.5000	ט		М
7440-28-0	Thallium	0.2000	ט		М

Color	Before:	YELLOW	Clarity Before:	CLEAR	Texture:	NONE
Color	After:	COLORLESS	Clarity After:	CLR/FIL	Artifacts:	
Commer	nts:					<del></del>

### -1-

# **INORGANIC ANALYSIS DATA SHEET**

SAMPLE	NO.	
		-
GW0308		

_ntract: NY02-258

ے Code: STLNY

Case No.:

SAS No.:

SDG NO.: A02-9633

matrix (soil/water): WATER

wevel (low/med):

LOW

Lab Sample ID: AD229961

Date Received: 9/28/02

CAS No.	Analyte	Concentration	c	Q	м
7440-38-2	Arsenic	1.990	1-1	•	M
7440-43-9	Cadmium	0.5000	ן ט		M
7440-28-0	Thallium	0.2000	ט		M

Color Before:	COLORLESS	Clarity Before:	CLEAR	Texture:	NONE
Color After:	COLORLESS	Clarity After:	CLR/FIL	Artifacts:	
Comments:					
_	<del> </del>				

-1-

# **INORGANIC ANALYSIS DATA SHEET**

SMILL	e NO.	
GW0309		

Contract: NY02-258

Lab Code: STLNY

Case No.:

SAS No.:

SDG NO.: A02-9633

fatrix (soil/water):

WATER

Lab Sample ID: AD229962

Level (low/med):

LOW

Date Received: 9/28/02

CAS No.	Analyte	Concentration	c	Q	м
7440-38-2	Arsenic	4.420	1		М
7440-43-9	Cadmium	0.5000	טן		М
7440-28-0	Thallium	0.2000	ט		М

Color	Before:	YELLOW	Clarity Before:	CLEAR	Texture:	NONE
Color	After:	COLORLESS	Clarity After:	CLR/FIL	Artifacts:	
Commen	its:	·				

#### -1-

# **INORGANIC ANALYSIS DATA SHEET**

SAMPLE	NO.	
GW0310		

_ntract: NY02-258

b Code: STLNY

Case No.:

SAS No.:

SDG NO.: A02-9633

_atrix (soil/water): WATER

Lab Sample ID: AD229963

-evel (low/med):

LOW

Date Received: 9/28/02

CAS No.	Analyte	Concentration	c	Q	М
7440-38-2	Arsenic	12.2	+ 1		М
7440-43-9	Cadmium	0.5000	ן ט		M
7440-28-0	Thallium	0.2000	ט		М

Color Before:	YELLOW	Clarity Before:	CLEAR	Texture:	NONE
Color After:	COLORLESS	Clarity After:	CLR/FIL	Artifacts:	

# **INORGANIC ANALYSIS DATA SHEET**

:ontract: NY02-258

ab Code: STLNY

Case No.:

SAS No.:

SDG NO.: A02-9633

latrix (soil/water):

WATER

Lab Sample ID: AD229964

evel (low/med):

Date Received: 9/28/02

CAS No.	Analyte	Concentration	С	Q	М
7440-38-2	Arsenic	3.550	1		м
7440-43-9	Cadmium	0.8312	1		м
7440-28-0	Thallium	0.2000	ט		м

Color	Before:	COLORLESS	Clarity Before:	CLEAR	Texture:	NONE
Color	After:	COLORLESS	Clarity After:	CLR/FIL	Artifacts:	
Commen	ts:					

#### -1-

# INORGANIC ANALYSIS DATA SHEET

SAMPLE	NO.	

GW0312	-		

_ntract: NY02-258

_b Code: STLNY

Case No.:

SAS No.:

SDG NO.: A02-9633

_trix (soil/water):

WATER

Lab Sample ID: AD229965

revel (low/med):

LOW

Date Received: 9/28/02

CAS No.	Analyte	Concentration	C	Q	м
7440-38-2	Arsenic	3.330	1		м
7440-43-9	Cadmium	0.8508			М
7440-28-0	Thallium	0.2000	ש		м

Color Before:	COLORLESS	Clarity Before:	CLEAR	Texture:	NONE
Color After:	COLORLESS	Clarity After:	CLR/FIL	Artifacts:	
_					

-1-

# **INORGANIC ANALYSIS DATA SHEET**

SAMPLE	NO.		
GW0313			

Contract: NY02-258

Lab Code: STLNY

Case No.:

SAS No.:

SDG NO.: A02-9633

Matrix (soil/water):

WATER

Lab Sample ID: AD229966

Level (low/med):

Date Received: 9/28/02

CAS No.	Analyte	Concentration	c	Q	м
7440-38-2	Arsenic	4.890	-		м
7440-43-9	Cadmium	0.5000	שן		М
7440-28-0	Thallium	0.2000	ט		м

Color	Before:	YELLOW	Clarity Before:	CLEAR	Texture:	NONE
Color 2	After:	YELLOW	Clarity After:	CLR/FIL	Artifacts:	
Commen	ts:					

-1-

# INORGANIC ANALYSIS DATA SHEET

SAS No.:

SAMPLE	NO.	
		_

SDG NO.: A02-9633

GW0314

atrix (soil/water): WATER

Evel (low/med): LOW

Case No.:_____

Lab Sample ID: AD229969

Date Received: 9/28/02

CAS No.	Analyte	Concentration	C	Ω	м
7440-38-2	Arsenic	41.5	1		М
7440-43-9	Cadmium	0.5000	ט	1	м
7440-28-0	Thallium	0.2000	ט		М

Color Before	YELLOW	Clarity Before:	CLEAR	Texture:	NONE
olor After:	COLORLESS	Clarity After:	CLR/FIL	Artifacts:	
_					

# -1-

# **INORGANIC ANALYSIS DATA SHEET**

SAMPLE	NO.	_
GW0315		

ontract:	NY02-258

ab Code: STLNY

Case No.:

SAS No.:

SDG NO.:

A02-9633

atrix (soil/water):

WATER

Lab Sample ID: AD229970

evel (low/med):

LOW

Date Received: 9/28/02

CAS No.	Analyte	Concentration	С	Q	М
7440-38-2	Arsenic	2.900	1		м
7440-43-9	Cadmium	0.5000	ט		M
7440-28-0	Thallium	0.2000	U		M

Color Before:	COLORLESS	Clarity Before:	CLEAR	Texture:	NONE
Color After:	COLORLESS	Clarity After:	CLR/FIL	Artifacts:	
Comments:					
				· · · · · ·	<u></u>

-1-

# INORGANIC ANALYSIS DATA SHEET

SAMPLE N	O.

THIC	21	_	

_ntract: NY02-258

_b Code: STLNY

Case No.:

SAS No.:

SDG NO.: A02-9633

atrix (soil/water): WATER

Lab Sample ID: AD229971

revel (low/med):

LOW

Date Received: 9/28/02

CAS No.	Analyte	Concentration	C	Q	М
7440-38-2	Arsenic	2.830	1		M
7440-43-9	Cadmium	0.5000	ט		M
7440-28-0	Thallium	0.2000	ט		М

Color Before:	COLORLESS	Clarity Before:	CLEAR	Texture:	NONE
Color After:	COLORLESS	Clarity After:	CLR/FIL	Artifacts:	
omments:	·				
_	<del></del>				

-1-

# **INORGANIC ANALYSIS DATA SHEET**

CAMDIE	MO
SAMPLE	no.

GW031	.7

Contract: NY02-258

Lab Code: STLNY

Case No.:

SAS No.:

SDG NO.: A02-9633

Matrix (soil/water):

WATER

Lab Sample ID: AD229972

Level (low/med):

LOW

Date Received: 9/28/02

CAS No.	Analyte	Concentration	c	Q	M
7440-38-2	Arsenic	10.9	$\dagger$		м
7440-43-9	Cadmium	0.5000	ט		M
7440-28-0	Thallium	0.2000	ט		M

Color	Before:	COLORLESS	Clarity Before:	CLEAR	Texture:	NONE
Color	After:	COLORLESS	Clarity After:	CLR/FIL	Artifacts:	
Commen	its:					
			····			

### INITIAL AND CONTINUING CALIBRATION VERIFICATION

4 .	. *	1.
	y r	

	an'	tr	a	C	t	:	N	Y	0	2	-	2	5	8
_							_			_			_	_

 D Code:
 STLNY
 Case No.:
 SAS No.:
 SDG NO.:
 A02-9633

_itial Calibration Source: _

_ntinuing Calibration Source:

Concentration Units: ug/L

•		Initial Ca	libration	Continuing Calibration				
_	Analyte	True	Found %R(1)	True	Found %R(1)	Found %R(1)	м	
į	Arsenic	25	25.2 100.8	25	25.0 100.0	25.5 102.0	M	
į	Cadmium	25	25.2 100.8	25	24.9 99.6	25.2 100.8	М	
- [	Thallium	25	24.7 98.8	25	24.7 98.8	26.3 105.2	М	

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

-2A-

# INITIAL AND CONTINUING CALIBRATION VERIFICATION

Contract:	NY02-258				
ab Code:	STLNY	Case No.: _	SAS No.:	SDG NO.: A02-9633	
nitial Ca	alibration Sou	rce:		<del></del>	
ontinuin	Calibration	Source:			

Concentration Units: ug/L

	Initial	Calibration	Continuing Calibration					
Analyte	True	Found %R(1)	True	Found %R(1)	Found %R(1)	м		
Arsenic	İ		25	25.5 102.0	24.8 99.2	М		
Cadmium			25	25.2 100.8	25.1 100.4	М		
Thallium	II		25	25.6 102.4	27.3 109.2	M		

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

-3-

#### **BLANKS**

ontract:	NY02-258

 ab Code:
 STLNY
 Case No.:
 SAS No.:
 SDG NO.:
 A02-9633

reparation Blank Matrix (soil/water): WATER

eparation Blank Concentration Units (ug/L or mg/kg): UG/L

	Initial Calib. Blank		Continuing Calibration Blank (ug/L)					Preparation Blank			
Analyte	(ug/L)	c	1	С	2	С	3	c		c	М
Arsenic	1.0000	וטוכ	1.0000	υ	1.0000	U	1.0000	U	1.0000	บ	M
Cadmium	0.5000	שׁכ	0.5000	ש	0.5000	ן ט	0.5000	ט	0.5000	U	M
Thallium	0.2000	שׁ	0.2000	ט	0.2000	ן ט	0.2000	ט	0.2000	U	M

-3-

# BLANKS

ontract:	NY02-25	8				
ab Code:	STLNY	Case No.:	SAS No.:		SDG NO.: A02-9633	
reparatio	n Blank	Matrix (soil/water):	VATER			
reparation	n Blank	Concentration Units (	ug/L or mg/kg):	UG/L		

	Initial Calib. Blank			Con	tinuing Blank	Calibr	ation		Preparation Blank		
Analyte	yte (ug/L)	) c	1	C	2	С	3	С		С	М
Arsenic	1	1 1	1.0000	וטו					ĺ !	i	M
Cadmium	1	i i	0.5000							i	M
Thallium	1	i i	0.2000	ן ט						i	М

### -5A-

### SPIKE SAMPLE RECOVERY

<u> </u>				SAMPLE NO.	
_				GW0313 MS	
ntract:	NY02-258			<u> </u>	_
_b Code:	STLNY	Case No.:	SAS No.:	SDG NO.: A02-9633	

trix (soil/water): WATER Level (low/med): LOW

- Solids for Sample: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	С	Sample Result (SR) C	Spike Added (SA)	%R	Ω	м
Arsenic	75 - 125	26.8151		4.8893	20.00	110		М
Cadmium	75 - 125	21.6648	Ī	0.5000 U	20.00	108		М
Thallium	75 - 125	20.5875		0.2000 U	20.00	103		М

ments:

#### -5A-

### SPIKE SAMPLE RECOVERY

SAMPLE NO.

GW0313	SD		

ontract: NY02-258

ab Code: STLNY

Case No.:

SAS No.:

_ SDG 1

SDG NO.: A02-9633

atrix (soil/water): WATER Level (low/med):

LOW

Solids for Sample: 0.0

Concentration Units (ug/L or mg/kg dry weight):

UG/L

Analyte	Control Limit %R	Spiked Sample Result (SSR) C	Sample Result (SR) C	Spike Added (SA)	%R	ΩМ
Arsenic	75 - 125	25.8377	4.8893	20.00	105	м
Cadmium	75 - 125	21.4163	0.5000 บ	20.00	107	м
Thallium	75 - 125	20.3189	0.2000 U	20.00	102	М

mments:	

trix (soil/water): WATER

# EXPONENT, INC. -5B-

000064

LOW

#### POST DIGEST SPIKE SAMPLE RECOVERY

_				SAMPLE NO.
- ntract:	NY02-258			GW0313A
-	STLNY	Case No.:	SAS No.:	SDG NO.: A02-9633
_				

Concentration Units: ug/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	С	Sample Result (SR) C	Spike Added(SA)	%R	Ω	м
Arsenic	i i	26.8794		4.8893	20.00	110.0		м
Cadmium	1	22.1285		0.5000 U	20.00	110.6		м
Thallium	1	20.6224		0.2000 ប	20.00	103.1		М

Level (low/med):

# EXPONENT, INC. **DUPLICATES**

SAMPLE NO.

<b>W</b> 0313	SD		
---------------	----	--	--

Contract: NY02-258

ab Code: STLNY

Case No.:__

SAS No.:

SDG NO.: A02-9633

fatrix (soil/water): WATER

Level (low/med):

LOW

: Solids for Sample: 0.0

% Solids for Duplicate: 0.0

Concentration Units (ug/L or mg/kg dry weight):

UG/L

Analyte	Control Limit	Sample (S) C	Duplicate (D) C	RPD	Q	м
Arsenic	1	26.8151	25.8377	3.7	1	М
Cadmium	Ī	21.6648	21.4163	1.2	Î	М
Thallium		20.5875	20.3189	1.3	Ì	м

## EXPONENT, INC.

-7-

### LABORATORY CONTROL SAMPLE

Oncrace.	N102 238			
ab Code:	STLNY	Case No.:	SAS No.:	SDG NO.: A02-9633
olid LCS	Source:			
ຸ 'ໝາອວນຣ Lo	S Source:			

	Aqueou	s (ug/L)		Solid (mg	g/kg)	
Analyte	True	Found %R	True	Found C	Limits	₹R
Arsenic	20.00	21.1545   105.8		I I I	Ì	
Cadmium	20.00	21.1043   105.5				
Thallium	20.00	21.2321  106.2				

# Appendix B

**Borehole Logs** 



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Project No: 8600B3N.005.0402

Project: Ventron/Velsicol Site

Client: Rohm and Haas

Location: Wood-Ridge/Carlstadt, NJ

Borehole: B-1

Ground surface: Level asphaltic concrete

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m ³ )	INTERVAL	GROU SYMB		LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DE (not applicable)	TAIL
- 0		700/	1.4	0.004			SC	Asphaltic concrete Subbase Clayey, fine SAND w/ fine to coarse gravel, red (2.5YR 4/6), day 20-30%, damp.		0 1
3		70%	3.4	0.011	$\bigwedge$					2 3
5		90%	2.9	0.000	$\bigvee$		Mμ	SILT, olive-gray (5Y 4/2), moist.  Becomes wet @ 5'.  Color change to yellow-brown (10YR 5/6) @ 5.7'	BACKFILLED W/ BENTONITE	4 5 1 1
7			1.2	0.000	$\bigwedge$		CL	BGS w/ olive-brown (2.5Y 5/3) mottling.  CLAY, brown (7.5Y 5/3) w/ slight yellow-brown (10YR 5/6) mottling, moist to wet.  Color change to brown (10YR 5/3) @ 7.5' BGS w/ trace silt.		7 — 8 —
9		75%	1.2	0.005	$\bigvee$		SP	Fine SAND w/ trace silt, brown (10YR 5/3), wet,		9 1
11			1.2	0.003	$\bigwedge$		or !	increased silt with depth.		11 - 12 - 12 - 1
13		75%	6.7	0.003	$\bigvee$		SM	Grades to slightly silty, fine SAND, brown (10YR 5/3), silt 10-20%, wet.		13 — 1 13 — 1 14 — 1
15			1.6	0.000						15
17		80%	5.2	0.000	$\bigvee$					17 - 18 - 18 - 1
19			1.6	0.003	$\bigwedge$		CL	CLAY, dark gray-brown (2.5Y 4/2), very firm, moist.		19—
-							T	Total depth @ 20' BGS.		

Drilled By: Summit Drilling

Well Casing Elevation: NA

Datum: NA

Drill Method: Push probe

Ground Surface Elevation: NA

Drill Date: 9 October 2002

Borehole Diameter: 2.0"



Project: Ventron/Velsicol Site

Client: Rohm and Haas

Location: Wood-Ridge/Carlstadt, NJ

Borehole: B-2

Ground surface: Level asphaltic concrete

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m ³)	INTERVAL	GRO SYME		LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
									0
1 1		009/	15.6	0.009	$\bigvee$		CL	Asphaltic concrete Subbase Slightly sandy CLAY, very dark brown (7.5Y 2.5/2), damp.	
3		90%	12.6	0.004	$\bigwedge$		ML	Color change to red (2.5Y 4/6) w/ hard clay chunks.  SILT, olive-gray (5Y 4/2), moist to wet.	3-
5		80%		0.005			모	Becomes wet @ 5' BGS. Color change to yellow-brown (10YR 5/6) w/ slight light olive-brown (2.5Y 5/3) mottling, wet.	BACKFILLED  W/ BENTONITE  GROUT  4
7			2.1	0.000	$/ \setminus$		다 8월 8년	CLAY layer, same color as above.  Silty fine SAND/ sandy SILT, brown (10YR 4/3) w/ some yellow-brown (10YR 5/6) mottling, wet.	7 - 1
9		75%	1.2	0.004	$\bigvee$				8   1   9   1   10   10   10   10   10
- 11 - 12			2.1	0.000	$/ \setminus$		ML	Clayey SILT, dark gray-brown (2.5Y 4/2), wet.	11 —
13	- '	500	1.2	0.000	$\bigvee$				13-1
14 - - - - - - - - - - - - -		20%			$\left  \right\rangle$		CL.	Driller reports harder drilling @ 14' BGS. CLAY, dark gray (10YR 4/1), moist to wet, very firm.	15-
16								Total depth @ 16' BGS.	16
17									18— 18—
- 19 									19

Drilled By: Summit Drilling

Well Casing Elevation: NA

Datum: NA

Drill Method: Push probe

**Ground Surface Elevation: NA** 

Drill Date: 9 October 2002

Borehole Diameter: 2.0"

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Project No: 8600B3N.005.0402

Project: Ventron/Velsicol Site

Client: Rohm and Haas

Location: Wood-Ridge/Carlstadt, NJ

Borehole: B-3

Ground surface: Level asphaltic concrete

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m³)	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
							Acabaki	0
E					N A		Asphaltic concrete Subbase	E 🔘
<u> </u>		050/		0.000	$\bigvee$	CL	Sandy CLAY, fine to medium sand 10-20%, very dark brown (7.5Y 2.5/2), abundant brick, wood, gravel chunks, very minor fine grain size	1 1
3		95%		0.004	$\bigwedge$	ML	white flecks, damp.  SILT, olive-gray (5Y 4/2), moist.	3
<u> </u>					$\langle - \rangle$		Color change to yellow-brown (10YR 5/6) w/ some light olive-brown (2.5Y 5/3) mottling, some black staining near color change @ 3.8' BGS.	4 1
_ _ 5 _ _		700/		0.000	$\bigvee$		black staining near color change @ 3.8' BGS.	BACKFILLED 5 1
- <del>6</del> -	-	70%		0.000	$\Lambda$	<del>일</del>	CLAY layer, same color as above.	GROUT 6
- 8						М̈́L	Sandy SILT, fine sand 20-30%, brown (10YR 4/3), slight yellow-brown mottling (10YR 4/6), wet.	8 -
- - - - -				0.000	$\setminus /$	SM	Silty fine SAND, silt 20-30%, gray (5Y 5/1), wet.	9 7
- 10 - 10		25%		-	$\left[ \begin{array}{c} \lambda \end{array} \right]$			10-1
- 11 ;					$/\setminus$		CLAY layer, 1" thick.	11 7
13				0.000	$\setminus /$	Nicolar		13-
14		25%			$ \bigvee $	SP	Fine to medium SAND, predominantly fine-	14
15					$\left  / \right $		grained, dark gray (2.5Y 4/1), uniform, wet.	15—
16 -				}				16-
17				0.000		SP/ CL	Bedded SAND (beds up to 2" thick), dark gray (2.5Y 4/1) and CLAY, banded brown (7.5YR	17 -
- 18 · - - - - - 19		100%	33.4	0.000	$\bigwedge$		5/3) and gray (2.5Y 5/1), wet.	18-7-19-1
- 13   - 20				0.555				20
20								

Drilled By: Summit Drilling

Weil Casing Elevation: NA

Datum: NA

Drill Method: Push probe

Ground Surface Elevation: NA

Drill Date: 9 October 2002

Borehole Diameter: 2.0"

 $\mathbf{E}^{\mathcal{X}}$ 

Project No: 8600B3N.005.0402

Project: Ventron/Velsicol Site

Client: Rohm and Haas

Location: Wood-Ridge/Carlstadt, NJ

Borehole: B-3

Ground surface: Level asphaltic concrete

Geologist: David Lamadrid, R.G.

								<del></del>	
DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m³)	INTERVAL	GRC SYMI		LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
20						01111	SP/	Bedded SAND (beds up to 2" thick) dark gray	20
- - - 21 -			13.2	0.003	$\left  \cdot \right $		CL	Bedded SAND (beds up to 2" thick), dark gray (2.5Y 4/1) and CLAY, banded brown (7.5YR 5/3) and gray (2.5Y 5/1), wet.	BACKFILLED
- 22 - - - - 23		60%	2.1	0.000	$\Big \Big/\Big $		CL	CLAY, dark gray (10YR 4/1), very firm, moist to wet.	w/ BENTONITE 22— GROUT 23— 23—
					<u> </u>			Total depth @ 24' BGS.	24
_ 25									25—
<u> </u>									20
26  									26—
_ 27 _									27-
28									28
29									29—
									30—
E									= = = = = = = = = = = = = = = = = = = =
— 31 ⊏									31—
_ _ 32 _									32
_ 33									33—
- - 34									34
E									
— 35 -									35— 
36									36 <del>-</del>
37									37
Ę,									38—
- 38 -									3
39									39
-40-				-					40
	l	<u> </u>		<u></u>	<u> </u>	L	L	<u> </u>	

Drilled By: Summit Drilling

Well Casing Elevation: NA

Datum: NA

Drill Method: Push probe

Drill Date: 9 October 2002

**Ground Surface Elevation: NA** 

Borehole Diameter: 2.0"

 $\mathbf{F}^{\mathbf{\chi}}$ 

Project No: 8600B3N.005.0402

Project: Ventron/Velsicol Site

Client: Rohm and Haas

Ground surface: Level asphaltic concrete

Borehole: B-4

Location: Wood-Ridge/Carlstadt, NJ

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m ³)	INTERVAL	GRC SYMI		LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
-					\ /		ML	Asphaltic concrete  Sandy SILT w/ some fine gravel, red (10YR 4/6).	
<u>+</u> 1		100%	1.4	0.024	V		IVIL	Color change to dark brown (10YR 3/3) w/ white crystalline grains scattered throught, damp to moist.	1 - 1
3		1007		0.007	$\bigwedge$			SILT, dark brown (10YR 3/3), quickly grades to olive-gray (5Y 5/2), moist.	
5		100%		0.013	$\bigvee$		又	Color change to yellow-brown (10YR 5/6) w/ light olive-brown (2.5Y 5/3) mottling, wet.	BACKFILLED 5— W/ BENTONITE — 6—
F		100 /			Λ		SM	Silty CLAY layer, 1" thick, color as above.	GROUT 6
E 7			0.8	0.007	$/\setminus$		эм	Silty fine SAND, yellow-brown (10YR 5/6) w/ light olive-brown (2.5Y 5/3) mottling, wet.	7 - 1
9 - 10		80%	2.0	0.011	V		SP	Fine to medium SAND, predominantly fine- grained, olive (5Y 5/3), wet.	8 1 1 1 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
11			6.1	0.009				Color change to gray (5Y 5/1).	11 —
13		80%	13.8	0.010	$\bigvee$				13-
15			1.2	0.000	$\bigwedge$				15—
17		200/	0.9	0.009	$\bigvee$				17 —
— 18 - - - - 19 -		30%			$/ \setminus$				18—
20									20

Drilled By: Summit Drilling

Well Casing Elevation: NA

Datum: NA

Drill Method: Push probe

Drill Date: 8 October 2002

Ground Surface Elevation: NA

Borehole Diameter: 2.0"

 $\mathbf{F}^{\mathcal{X}^{\scriptscriptstyle{\mathsf{m}}}}$ 

Project No: 8600B3N.005.0402

Project: Ventron/Velsicol Site

Client: Rohm and Haas

Location: Wood-Ridge/Carlstadt, NJ

Borehole: B-4

Ground surface: Level asphaltic concrete

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m³)	INTERVAL	GRC SYMI		LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
									20
<del></del>		709/	0.9	0.005	$\bigvee$		SP	Fine to medium SAND, predominantly fine-grained, gray (5Y 5/1), wet.	21 BACKFILLED
- 22 - - - 23 -		70%	1.4	0.008	$\left  \right\rangle \left\langle \right\rangle$		CL	CLAY, gray (2.5Y 5/1), medium to high plasticity, 1* thick sand layer, wet.	w/ BENTONITE 22— GROUT 23— 23—
24								Total depth @ 24' BGS.	
_ 25 									25
<b>—</b> 26						,			26
27					•				27_ 
E 28									28-
29							i.		29— 1
30					i				30-
31									31-
32									32-
33									33-7
34									34-
35									35-
- - 36 -									36-1
37									37—
38									38_
39 									39 <u>-</u>
40-		ļ					_		40
L						L			

Drilled By: Summit Drilling

Well Casing Elevation: NA

Datum: NA

Drill Method: Push probe

Drill Date: 8 October 2002

Ground Surface Elevation: NA

Borehole Diameter: 2.0"

 $\mathbf{F}^{\mathbf{x}}$ 

Project No: 8600B3N.005.0402

Project: Ventron/Velsicol Site

Client: Rohm and Haas

Ground surface: Level asphaltic concrete

Borehole: B-5

Location: Wood-Ridge/Carlstadt, NJ

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m ³)	INTERVAL	NTERVAL SAWBOT BLOOM		LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)	
1		100%	0.6	0.038			SM	Asphaltic concrete  Silty fine SAND w/ fine gravel, dark red-brown (5YR 2.5/2), abundant brick debris, damp to moist. As above w/ wood debris from 1.6-2' BGS.		1 - 1
3		1007	0.4	0.000	$\bigwedge$		ML	SILT, very dark brown (10YR 3/3), quickly grades to mottled light olive-brown (2.5Y 5/3) and olive-yellow (2.5Y 6/8), slightly micaceous, moist.		3-
5		100%	0.0	0.156	X		立	As above, wet.	BACKFILLED w/ BENTONITE	5-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1
7	SP0001 SP0002		2.1	0.698	X		SP	Fine to medium SAND, yellow-brown (10YR 5/6), wet.  Indicates sample was analyzed.	! GROUT	7
9	SP0003 SP0004	100%		0.861	X					8
- 10 - - - - - - - - - - - - - - - - - - -			1	0.119	$\bigvee$			Fine SAND, light olive-brown (2.5Y 5/4), minor medium grained sand, scattered thin layers (<1/2" thick) w/ trace silt, wet.		10-
13		90%	1.7	0.003	$\bigvee$					13-1
15			0.8	0.015	$/ \setminus$					15
17		90%	2.8	0.026	$\bigvee$					17 –
19		3U 70	7.1	0.000	$/\!\!\!\!/$			Fine to medium SAND, predominantly fine-grained, dark gray (2.5Y 4/1), wet.		18— 19— 19—
- 20										50

Drilled By: Summit Drilling

Well Casing Elevation: NA

Datum: NA

Drill Method: Push probe

Ground Surface Elevation: NA

Drill Date: 8 October 2002

Borehole Diameter: 2.0"



Project: Ventron/Velsicol Site

Client: Rohm and Haas

Ground surface: Level asphaltic concrete

Borehole: B-5

Location: Wood-Ridge/Carlstadt, NJ

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m³)	INTERVAL	GRO SYMI		LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
20 - - - - 21 - -		80%	0.4	0.010			SP	Fine to medium SAND, predominantly fine-grained, dark gray (2.5Y 4/1), wet.	BACKFILLED 5 W/ BENTONITE 22—
23		00 %	1.2	0.008					GROUT 23-
25		70%	0.0	0.015	$\bigvee$				24 — - 25 — - 26 —
27		7074	0.4	0.008	$\bigwedge$		CH CI	CLAY, gray (10YR 6/1), medium to high plasticity, wet.  Sand layer, gray (10YR 6/1), 1" thick @ 27' BGS.	27-
- - - 29								Total depth @ 28' BGS.	29—
31									30— 31— 31— 32—
33			  - 	;					32 - - - - - - - - - - - - - - - - - - -
35									35— 35— 36—
- 37 - 37 - 38									30 — - 37 — - - 38 —
- - - - 39 - - -									35 - - - 39 - -

Drilled By: Summit Drilling

Well Casing Elevation: NA

Datum: NA

Drill Method: Push probe

Ground Surface Elevation: NA

Drill Date: 8 October 2002

Borehole Diameter: 2.0"

Project: Ventron/Velsicol Site

Client: Rohm and Haas

Ground surface: Level asphaltic concrete

Borehole: B-6

Geologist: David Lamadrid, R.G.

Location: Wood-Ridge/Carlstadt, NJ

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m ³)	INTERVAL	GROUI SYMBO		LITHOLOGIC DESCRIPTION	WELL CONSTRI (not app	
1		25%		0.014	$  \setminus  $	000000	ЭW	Asphaltic concrete Fine to coarse GRAVEL w/ trace fine silt.		1 - 1
3					$/ \setminus$		VIL :	SILT, mottled light olive-brown (2.5Y 5/3) and olive-yellow (2.5Y 6/8), wet.		3-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1
5		9.09/		0.083					BACKFILLED W/ BENTONITE	5
7		80%		0.036	//	§	šм	Silty fine SAND, silt 10-20%, yellow-brown (10YR 5/6), wet.	GROUT	6 <del>-  </del> 7 <del>-                                     </del>
9				0.103		<u> </u>	SP	Fine to medium SAND, dark gray (5YR 4/1), wet.		8 <del> </del>   9   1   1   1   1   1   1   1   1   1
10 11 11		80%		0.259	$\left  \right\rangle$		SM	Silty fine SAND, silt: 5-15%, dark gray (5YR 4/1), wet.		10-
12 - - - - 13				0.093		S	SP	Fine to medium SAND, dark gray (5YR 4/1), predominantly fine grained, few scattered thin layers (<1/4" thick) w/ trace sitt, wet.		12-
— 14 — 15		50%			$\left  \right $					14-
16 - - - 17				0.044						16-1
18		100%		0.056						18 - 19 - 19 - 1
20										20

Drilled By: Summit Drilling

Well Casing Elevation: NA

Datum: NA

Drill Method: Push probe

Ground Surface Elevation: NA

Sheet: 1 of 2

Drill Date: 8 October 2002

Borehole Diameter: 2.0"



Project: Ventron/Velsicol Site

Client: Rohm and Haas

Ground surface: Level asphaltic concrete

Borehole: B-6

Location: Wood-Ridge/Carlstadt, NJ

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m³)	INTERVAL	GRO SYM		LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
- <del>20</del> - - - 21 -		20%	0.1	0.333			SP	Fine to medium SAND, dark gray (5YR 4/1), predominantly fine-grained, few scattered thin layers (1/4" thick) w/ trace silt, wet.	BACKFILLED
- 22 - 23 - 23		20%			$\left  \right $				w/ BENTONITE 22— GROUT 23—
24 - - - 25			0.6	0.133				Grades to olive-brown (2.5Y 4/3).	24—
26 - - - - 27		70%	0.9	0.014	$\left  \right\rangle$		CH CI	CLAY, gray (10YR 6/1), medium to high plasticity, wet.	26
- 28 - - - 29 -			-			7777		Total depth @ 28' BGS.	29
- 30 - - - - 31									30- - - - 31-
32 - - - - - - - - - - - - - - - - - - -									32 <del>-</del> 33 <del>-</del>
- - 34 - - - - 35						:			34— 35—
- - - 36									36-
37   38 									37 — - - 38 —
39 - - - 40									39 -

Drilled By: Summit Drilling

Well Casing Elevation: NA

Datum: NA

Drill Method: Push probe

Ground Surface Elevation: NA

Drill Date: 8 October 2002

Borehole Diameter: 2.0"

 $\mathbf{F}^{\mathbf{x}}$ 

Project No: 8600B3N.005.0402

Project: Ventron/Velsicol Site

Client: Rohm and Haas

Ground surface: Level asphaltic concrete

Borehole: B-7

Location: Wood-Ridge/Carlstadt, NJ

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m³)	INTERVAL	GRC SYMI		LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
- 1				0.008			CL	Asphaltic concrete Subbase CLAY, reddish brown (5YR 4/3), damp to moist.	1 —
3		100%		0.004					3-1
5		1009		0.006	$\bigvee$		ML	Gravelly layer from 4.8 to 5' BGS. SILT, olive-gray (5Y 4/2) w/ slight yellowish mottling, moist to wet, few rootlets at contact.	BACKFILLED  W/BENTONITE  CROUT
7		1007		0.004	$\bigwedge$	7///2	□ CL SP	Wet @ 6.3' BGS.  CLAY, color as above.  Fine to medium SAND, olive-brown (2.5Y 4/3),	GROUT 6-7-7-7-7-7-7-7-7-7-7-7-7-7-7-7-7-7-7-7
9 10		80%	6.3	0.003	V			predominantly fine-grained, trace silt, wet.	8 — 9 — 10 —
11 11 12		00 70	37.7	0.000	$\bigwedge$		SM	Increased SILT w/ depth to 5-15% (silty sand).	11-
13		75%		0.003	$\bigvee$		SP	Fine to medium SAND, brown (7.5YR 4/3), predominantly fine grained, few thin (<1/4" thick) clay layers of the same color, wet.	13-1
15				0.000	$\bigwedge$				15-1
17		80%	6.3	0.003	$\bigvee$	77777		CLAY layer, 2" thick @ 16' BGS.	17—
18		00 /	5.8	0.005	$\bigwedge$	77772	:	CLAY layer, 2" thick @ 19.7' BGS.	18—
20	_								20

Drilled By: Summit Drilling

Well Casing Elevation: NA

Datum: NA

Drill Method: Push probe

Ground Surface Elevation: NA

Drill Date: 9 October 2002

Borehole Diameter: 2.0"



Project: Ventron/Velsicol Site

Client: Rohm and Haas

Ground surface: Level asphaltic concrete

Borehole: B-7

Location: Wood-Ridge/Carlstadt, NJ

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m³)	INTERVAL	GROUP LITHOLOGIC SYMBOL DESCRIPTION		WELL CONSTRUCTION DETAIL (not applicable)		
		50%	4.2	0.008		SP CL/ CH	Fine to medium SAND, brown (7.5YR 4/3), predominantly fine-grained, few thin clay layers of same color (<1/4" thick), wet.  CLAY, brown (7.5YR 4/3), medium-high plasticity, single 1/2" thick sand layer, wet.	BACKFILLED 22 -		
23		30 %						GROUT 23-		
25							Total depth @ 24' BGS.	25 — 26 —		
27								27— - - - 28—		
29								29 —		
31								31 –		
33								33 <u>-</u> 34 <u>-</u>		
35								35— 35— 36—		
37			į					37— 38—		
39								39-		

Drilled By: Summit Drilling

Well Casing Elevation: NA

Datum: NA

Drill Method: Push probe

Drill Date: 9 October 2002

Ground Surface Elevation: NA

Borehole Diameter: 2.0"

 $\mathbf{F}^{\mathbf{x}}$ 

Project No: 8600B3N.005.0402

Project: Ventron/Velsicol Site

Location: Wood-Ridge/Carlstadt, NJ

**...** 

Client: Rohm and Haas

Geologist: David Lamadrid, R.G.

Borehole: B-8

Ground surface: Level asphaltic concrete

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m³)	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	. WELL CONSTRUCTION DETAIL (not applicable)
0		100%	1.6	0.046		CI	Asphaltic concrete  Sandy CLAY, mottled dark red-brown (5YR 3/4), dark brown (7.5YR 3/3) and black (5Y 2.5/1) w/ some fine gravel and scattered broken brick, wood "pieces" from 2.2-3' BGS, damp to moist.	1 - 2 - 2 -
3			11.0	0.225	$\bigwedge$		CLAY, lime green (no soil color index) w/ thin layer of paper material, clay layer, bright light tan (no soil color index), moist.	3 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7
5		1000	33.9	0.018	$\setminus / $	P1	Organic layer @ 4.7' BGS, abundant fibrous roots and rootlets, very dark red-brown (2.5Y 5/3), moist.  Slightly fine, sandy SILT, light olive-brown (2.5Y	BACKFILLED 5
7		1009		0.026	$\bigwedge$	Si CI	5/4), moist.  Wet @ 6.3' BGS, grades to silty fine SAND, olive-gray (5Y 4/2), (10-20% silt).  CLAY, mottled it olive-brown (2.5Y 5/3) and	GROUT 6
9		700/	1.6	0.438		SI	olive-yellow (2.5Y 6/8), moist, low to medium plasticity.  Fine to med. SAND, yellow-brown (10YR 5/6), predominantly fine-grained, trace silt, wet.	8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
11		70%	1.6	0.028	$\bigwedge$	SI	Grades to brown (10YR 5/3), increasing silt (to	11 - 12 - 12 - 12 - 1
13		100%	1.6	0.009	$\bigvee$		20-30%) w/ depth (silty sand).	13-1
14 - - - - 15		100 %	0.9	0.004	/	CI		14—
17			1.2	0.009				16 - 17 - 17 - 17 - 17 - 17 - 17 - 17 -
18		100%	1.2	0.004	$\bigwedge$			18—
20					/ \		Total depth @ 20' BGS.	20

**Drilled By:** Summit Drilling

Well Casing Elevation: NA

Datum: NA

Drill Method: Push probe

Ground Surface Elevation: NA

Drill Date: 9 October 2002

Borehole Diameter: 2.0"



Project: Ventron/Velsicol Site

Location: Wood-Ridge/Carlstadt, NJ

Client: Rohm and Haas

Ground surface: Level asphaltic concrete

Borehole: B-9

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m ³)	INTERVAL	GROUP SYMBO		LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
1	SP0005	100%	76.7	0.004	X		ic L	Asphaltic concrete  Clayey SAND, fine to coarse sand, clay 20-30% very dark brown (7.5Y 2.5/2), some scattered fine gravel, damp.  CLAY, dark brown (7.5YR 3/2), trace fine sand, some fine gravel and brick, damp.	1 - 1
3	SP0006	20%	25.8	0.000	X	M	AL.	some fine gravel and brick, damp.  Clayey SILT, brown (10YR 4/3), moist.  Indicates sample was analyzed.	3 1 1 1 4 1
5	SP0007	100%	6.3	0.000	X		AL	CLAY, black (10YR 2/1), moist, organic odor. SILT, olive-gray (5Y 4/2), moist.	BACKFILLED 5— W/ BENTONITE —— GROUT 6—
7	SP0008	10%	60.0	0.000	$\bigvee$				7 -
9 - 10	SP0009	100%	6.3	0.000	X	iiiiii v	Z SM	Sity fine SAND, yellow-brown (10YR 5/6), silt 10-20%, wet.	9
11	SP0010	20%	2.5	0.000	X	SI	P/ ;L	Bedded fine to medium SAND, yellow-brown (10YR 5/6) and day, yellow-brown (10YR 5/6), wet, beds up to 4* thick.	11 - 12 -
13	SP0011	100%	1.2	0.000	X				13-
- 15 - 16		0%			X	c	<u>.</u>	CLAY, yellow-brown, moist, firm.	15— 16—
17	SP0012	100%	1.2	0.000	X	c		CLAY, grayish brown (2.5Y 5/2), medium to high plasticity, few (2-1/4" thick) sand layers, wet.	17
19					X			Total depth @ 20' BGS.	19-

Drilled By: Summit Drilling

Well Casing Elevation: NA

Datum: NA

Drill Method: Push probe

Ground Surface Elevation: NA

Drill Date: 9 October 2002

Borehole Diameter: 2.0"

 $\mathbf{F}^{\mathbf{X}^{m}}$ 

Project No: 8600B3N.005.0402

Project: Ventron/Velsicol Site

Client: Rohm and Haas

Location: Wood-Ridge/Carlstadt, NJ

Borehole: B-10

Ground surface: Level asphaltic concrete

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m ³)	INTERVAL	GROUP SYMBOL	LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
1	SP0013 SP0014*	100%	6 2.1	0.000	X	CL	Asphaltic concrete Subbase Sandy CLAY, red (2.5YR 4/6) w/ fine gravel, sand 10-20%, minor wood debris, damp.  Indicates sample was analyzed.	1 - 1
3		5%	25.8	0.000				3-1
5	SP0015	100%	1.2	0.000	X	SC OL	Clayey, fine to coarse SAND, gray (10YR 4/1), abundant glass and white clayey material, wet.	BACKFILLED 5— w/ BENTONITE —
7		0%			X	ML	CLAY (2" thick), black (10YR 2/1), organic odor. SILT, olive-gray (5Y 4/2), wet.	GROUT 6 - 1
9	SP0016	100%	2.1	0.000	X		Fine sandy SILT, yellow-brown (10YR 5/6) and grayish brown (2.5Y 5/2), sand 10-20%, wet.	8-J
Ē	SP0017	80%	2.1	0.000	X	CH	CLAY, grayish-brown (2.5Y 5/2), medium- high plasticity, wet.	10-7
12 - - - - 13			- 1 - 1, <u>- 1</u>				Total depth @ 12' BGS. * Indicates duplicate sample	13
14								14 <del>-</del> - - - 15
16								16— 17—
- 18 - 19								18— 18— 19—
20								20-

**Drilled By:** Summit Drilling

Well Casing Elevation: NA

Datum: NA

Drill Method: Push probe

Drill Date: 9 October 2002

Ground Surface Elevation: NA

Borehole Diameter: 2.0"

 $\mathbf{E}^{\mathbf{x}}$ 

Project No: 8600B3N.005.0402

Project: Ventron/Velsicol Site

Client: Rohm and Haas

Ground surface: Soil

Location: Wood-Ridge/Carlstadt, NJ

Geologist: David Lamadrid, R.G.

Borehole: B-11

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m ³⁾	INTERVAL	GRC SYMI		LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
1	SP0018	100%	6	0.008	X		ML	Clayey SILT, dark olive-brown (2.5Y 3/3), some root fragments, minor asphalt from 0.7-0.9' BGS, damp to moist.  CLAY, red (7.5YR 3/3), hard solid clay chunks, damp to moist.  Indicates sample was analyzed.	1 - 2 - 2
5	SP0019	5% 100%		0.004	X		ML	Clayey SILT, very dark gray-brown (10YR 3/2), moist. SILT @ 5.5' BGS, olive-gray (5Y 4/2), moist.	BACKFILLED 5—
7	SP0020	80%		0.000			又	Color change to yellow-brown (10YR 5/6) w/ faint grayish brown (2.5Y 5/2) mottling. Wet @ 6.8' BGS.	GROUT 6
9	SP0021	100%	•	0.003	X		SP	Some black iron oxide staining from 8.7-9.2' BGS. Fine to medium SAND, predominantly fine-grained, trace fines, wet.	9-1
11	SP0022	100%	•	0.003	X		CL	Color change to grayish brown @ 10' BGS.  CLAY, dark gray-brown (2.5Y 4/2), wet.	10-
13 14 15 16 17 18 19 19 19								Total depth @ 12' BGS.	13 — 14 — 15 — 16 — 17 — 19 — 19 — 20 — 20 — 20 — 20 — 20 — 20 — 20 — 2

Drilled By: Summit Drilling

Well Casing Elevation: NA

Datum: NA

Drill Method: Push probe

Ground Surface Elevation: NA

Drill Date: 10 October 2002

Borehole Diameter: 2.0"

 $\mathbf{F}^{\mathbf{x}}$ 

Project No: 8600B3N.005.0402

Project: Ventron/Velsicol Site

Client: Rohm and Haas

Location: Wood-Ridge/Carlstadt, NJ

Borehole: B-12

Ground surface: Asphaltic concrete

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m³)	INTERVAL	GRC SYMI		LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)	
1 2	SP0023	100%		0.000	X		CL	Asphaltic concrete Subbase Sandy CLAY, red (2.5YR 4/6), fine sand 5-15%, few fine gravels, moist.  Indicates sample was analyzed.		1 - 1
3	SP0024	100%		0.000	X		ML ☑	SILT, dark brown (7.5YR 3/2), moist to wet.  Color change to yellow-brown (10YR 5/6) w/ some slight olive-brown (2.5Y 5/3) mottling, moist to wet.  Wet @ 4.7' BGS.	BACKFILLED w/ BENTONITE GROUT	3 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -
- - - - -	SP0025	90%		0.000				As above, becomes clayey SILT @ 7.4' BGS.	GROUT	6
- - - - - - -	SP0026 SP0027	80%		0.000			SM CL SP	Silty fine SAND, yellow-brown (10YR 5/6), silt 10-20%, increasing silt w/ depth, wet.  Grades to silty CLAY, dark gray-brown (10YR 3/2), wet.  Very fine to fine SAND, dark gray (2.5Y 4/1), wet.		10 11 11
13	SP0028	100%	,	0.000				As above w/ scattered clay layers (1/8-1/4" thick), gray (2.5Y 4/1).		13
15	SP0029	30%		0.000	$\bigvee$			Clay layers increase in number and thickness		15
17	SP0030	100%		0.000	$\bigwedge$			(up to 4" thick), clay is mottled gray (2.5Y 4/1) and brown (7.5YR 5/3), medium to high plasticity.		17 -
19	SP0031	70%		0.000	X					19-

Drilled By: Summit Drilling

Well Casing Elevation: NA

Datum: NA

Drill Method: Push probe

Ground Surface Elevation: NA

Drill Date: 13 November 2002

Borehole Diameter: 2.0"

 $\mathbf{E}^{\mathbf{x}}$ 

Project No: 8600B3N.005.0402

Project: Ventron/Velsicol Site

Client: Rohm and Haas

Location: Wood-Ridge/Carlstadt, NJ

Borehole: B-12

Ground surface: Asphaltic concrete

Geologist: David Lamadrid, R.G.

SAMPLE   B											
SP   Very fine to fine SANU, and gray (2.5Y 41), and (as above) layers up to 2" thick.   SP   Very fine to fine SANU, and gray (2.5Y 41), and (as above) layers up to 2" thick.   SP   Very fine to fine SANU, and gray (2.5Y 41), and (as above) layers up to 2" thick.   SP   Very fine to fine SANU, and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray	DEPTH (Feet)				Hg Vapor (mg/m³)	INTERVAL					
SP   Very fine to fine SANU, and gray (2.5Y 41), and (as above) layers up to 2" thick.   SP   Very fine to fine SANU, and gray (2.5Y 41), and (as above) layers up to 2" thick.   SP   Very fine to fine SANU, and gray (2.5Y 41), and (as above) layers up to 2" thick.   SP   Very fine to fine SANU, and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray (2.5Y 41), and gray	1		ļ			ļ		ļ			
SP   Very fine to three SANU, and gray (2.5Y ALT), other with clay layers up to 42 and gray (2.5Y ALT), other in the SANU, and gray (2.5Y ALT), other in the SANU, and gray (2.5Y ALT), other in the SANU, and gray (2.5Y ALT), other in the SANU, and gray (2.5Y ALT), other in the SANU, and gray (2.5Y ALT), other in the SANU, and gray (2.5Y ALT), other in the SANU, and gray for the SANU, and gray (2.5Y ALT), other in the SANU, and gray for the SANU, other in the SANU, and gray for the SANU, other in the SANU, and gray for the SANU, other in the SANU, and gray for the SANU, and gray for the SANU, other in the SANU, and gray for the SANU, other in the SANU, and gray for the SANU, other in the SANU, other in the SANU, and gray for the SANU, other in the SANU, and gray (2.5Y ALT), other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other in the SANU, other i	20				l						20
23 SP0033 100% 0.000  24	- 20					\ /		SP	Very fine to fine SAND, dark gray (2.5Y 4/1),		
23 SP0033 100% 0.000  24 SP0035 20% 0.000  27 SP0035 20% 0.000  29 SP0036 100% 0.000  30 SP7 As above w/ roughly equal percentage sand and clay beds (up to 6" thick), clay primarily brown w/ gray mottling.  31 SP0037 20% 0.000  32 SP0037 20% 0.000  33 SP0037 20% 0.000  34 SP7 As above w/ roughly equal percentage sand and clay beds (up to 6" thick), clay primarily brown w/ gray mottling.  31 SP0037 20% 0.000  32 SP0038 100% 0.000  33 SP0038 100% 0.000  34 SP7 As above w/ roughly equal percentage sand and clay beds (up to 6" thick), clay primarily brown w/ gray mottling.	F 21	SP0032	1009	6	0.000	IV		ļ	clay is, well we dray (2.5Y 4/1) and brown		21
23 SP0033 100% 0.000  25 SP0034 100% 0.000  27 SP0035 20% 0.000  28 SP0036 100% 0.000  29 SP0036 100% 0.000  CL Grades to CLAY w/ sand (as above) layers up to 2" thick.  31 SP0037 20% 0.000  CL Grades to CLAY w/ sand (as above) layers up to 2" thick.	F					$ /\rangle$			(7.51R 5/5), medium to high plasticity.		
BACKFILED W/ BENTONITE GROUT  25 SP0034 100% 0.000  27 SP0035 20% 0.000  29 SP0036 100% 0.000  30 SP/ As above w/ roughly equal percentage sand and clay beds (up to 6" thick), clay primarily brown w/ gray mottling.  CL Grades to CLAY w/ sand (as above) layers up to 2" thick.  CL Grades to CLAY w/ sand (as above) layers up to 2" thick.	- 22		<u> </u>			$\langle - \rangle$					22-
BACKFILED W/ BENTONITE GROUT  25 SP0034 100% 0.000  27 SP0035 20% 0.000  29 SP0036 100% 0.000  30 SP/ As above w/ roughly equal percentage sand and clay beds (up to 6" thick), clay primarily brown w/ gray mottling.  CL Grades to CLAY w/ sand (as above) layers up to 2" thick.  CL Grades to CLAY w/ sand (as above) layers up to 2" thick.	E					$\mathbb{N}$		ı			]
25 SP0034 100% 0.000  28 SP0036 100% 0.000  29 SP0036 100% 0.000  3P	<u> </u>	SP0033	1009	6	0.000	ΙX					23-
25 SP0034 100% 0.000  26 27 SP0035 20% 0.000  29 SP0036 100% 0.000  30 30 31 SP0037 20% 0.000  CL Grades to CLAY w/ sand (as above) layers up to 2" thick.  31 SP0037 20% 0.000  CL Grades to CLAY w/ sand (as above) layers up to 2" thick.	F					$V \setminus$		ŀ			‡
25 SP0034 100% 0.000  27 SP0035 20% 0.000  28 SP0036 100% 0.000  30 SP/ CL SP0037 20% 0.000  31 SP0037 20% 0.000  CL Grades to CLAY w/ sand (as above) layers up to 2" thick.  32 Thick.	- 24				_	\				w/ BENTONITE	24-
26 - 27 SP0035 20% 0.000 - 28 SP0036 100% 0.000 - 30 SP7 As above w/ roughly equal percentage sand and clay beds (up to 6" thick), clay primarily brown w/ gray mottling.  CL Grades to CLAY w/ sand (as above) layers up to 2" thick.  31 SP0037 20% 0.000 - 33 CL Grades to CLAY w/ sand (as above) layers up to 2" thick.	_ _ 25	SP0034	100%		0.000	V				GROUT	25
27 SP0035 20% 0.000 SP/ As above w/ roughly equal percentage sand and clay beds (up to 6" thick), clay primarily brown w/ gray mottling.  29 SP0036 100% 0.000 CL Grades to CLAY w/ sand (as above) layers up to 2" thick.  30 CL Grades to CLAY w/ sand (as above) layers up to 2" thick.	-					$ /\rangle$					
SP/   As above w/ roughly equal percentage sand and clay beds (up to 6" thick), clay primarily brown w/ gray mottling.   SP/   As above w/ roughly equal percentage sand and clay beds (up to 6" thick), clay primarily brown w/ gray mottling.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   SP/   As above w/ roughly equal percentage sand and clay beds (up to 6" thick), clay primarily brown w/ gray mottling.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   CL   Grades to 2"	- 26		<del>  -</del>		-	$\langle \rangle$		1			26
SP/   As above w/ roughly equal percentage sand and clay beds (up to 6" thick), clay primarily brown w/ gray mottling.   SP/   As above w/ roughly equal percentage sand and clay beds (up to 6" thick), clay primarily brown w/ gray mottling.   SP/   As above w/ roughly equal percentage sand and clay beds (up to 6" thick), clay primarily brown w/ gray mottling.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   SP/   As above w/ roughly equal percentage sand and clay beds (up to 6" thick), clay primarily brown w/ gray mottling.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   SP/   As above w/ roughly equal percentage sand and clay beds (up to 6" thick), clay primarily brown w/ gray mottling.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   SP/   As above w/ roughly equal percentage sand and clay beds (up to 6" thick), clay primarily brown w/ gray mottling.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   SP/   As above w/ roughly equal percentage sand and clay beds (up to 6" thick), clay primarily brown w/ gray mottling.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   SP/   As above w/ roughly equal percentage sand and clay beds (up to 6" thick), clay primarily brown w/ gray mottling.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   CL   Grades to CLAY w/ sand (as above) layers up to 2" thick.   CL   Grades to CLAY w/ sand (as above) layers up to	E					$ \setminus / $	<b>X</b>				]
SP/ CL   SP0036   100%   0.000   CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   S	27	SP0035	20%	}	0.000	X		l			27-
SP/ CL   SP0036   100%   0.000   CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   SP/ CL   S	F					$V\setminus$		ı			‡
31 SP0037 20% 0.000  CL Grades to CLAY w/ sand (as above) layers up to 2* thick.	-								As above w/ roughly equal percentage sand		28-
30	- 29	SP0036	1009		0.000	V		<u>ا</u> ا	brown w/ gray mottling.		29
32	<b>F</b>					$/\backslash$					- 1
CL Grades to CLAY w/ sand (as above) layers up to 2" thick.	30		├			$\langle - \rangle$		ļ			30-
CL Grades to CLAY w/ sand (as above) layers up to 2" thick.	E					$\backslash /$					3
CL Grades to CLAY w/ sand (as above) layers up to 2" thick.	31	SP0037	20%		0.000	X					31-
CL Grades to CLAY w/ sand (as above) layers up to 2" thick.	F ,,					$V \setminus$					<u>,</u> 1
- 34 - 35 - 36 - 37 - 38 - 38	- 05					$\Lambda = \Lambda$					32-
- 34 - 35 - 36 - 37 - 38 - 38	L 33					i\ /	<i>/////</i>	ᆚ	Grades to CLAY w/ sand (as above) layers up to 2" thick.		33
36 - 37 - 38 - 38	F										7
36 - 37 - 38 - 38	-34					X					34-
36 - 37 - 38 - 38	<b>L</b>		ĺ			/		ı			4
E-37 E-38	⊢ 35 ⊢					/					35
E-37 E-38	- 36		<u> </u>			\					<u>, 1</u>
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	39					/\					39
	E					<u> </u>		_[			‡
Total depth @ 40' BGS.									Total depth @ 40' BGS.		 

**Drilled By:** Summit Drilling

Well Casing Elevation: NA

Datum: NA

Drill Method: Push probe

Ground Surface Elevation: NA

Drill Date: 13 November 2002

Borehole Diameter: 2.0"

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Project No: 8600B3N.005.0402

Project: Ventron/Velsicol Site

Client: Rohm and Haas

Location: Wood-Ridge/Carlstadt, NJ

Borehole: B-13

Ground surface: Asphaltic concrete

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE SECOVERY (bbm) WAND (bbm)		Hg Vapor (mg/m³)	INTERVAL	GROUP SYMBOL		LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)	
1 2 3	SP0038	100%		0.003			CL	Asphaltic concrete Subbase Slightly sandy CLAY, red (2.5YR 4/6), fine sand 5-15%, damp to moist, some hard concretions, increased moisture with depth.  Indicates sample was analyzed.	
5	SP0040	100%	,	0.000	X		ML	Slightly clayey SILT, dark brown (7.5YR 3/2), black at contact (approx. 2" thick), moist to wet.	BACKFILLED 5
7	SP0041	100%	•	0.017	X		모	black at contact (approx. 2" thick), moist to wet.  Wet @ 6.3' BGS. SILT yellow-brown (10YR 5/6) with slight olive-brown (2.5Y 5/3) mottling, some iron-oxide flecks, wet.	GROUT 6
9	SP0042	100%	,	0.000	X				10
F	SP0043	70%		0.000	X	1///	CL SP	Silty CLAY, same color as above.  Very fine to fine SAND, yellow-brown (10YR 5/6), wet.	11
13	SP0044	100%		0.215	X			Color change to light olive-brown (2.5Y 5/4), few thin (1/4" thick) scattered sand layers with trace fines.	15
15	SP0045	70%		0.082	M				16
Ė	SP0046	100%		0.110	M				17
19	SP0047	30%		0.094	X				15
1 -									

Drilled By: Summit Drilling

Well Casing Elevation: NA

Datum: NA

Drill Method: Push probe

Ground Surface Elevation: NA

Drill Date: 13 November 2002

Borehole Diameter: 2.0"



Project: Ventron/Velsicol Site

Client: Rohm and Haas

Location: Wood-Ridge/Carlstadt, NJ

Borehole: B-13

Ground surface: Asphaltic concrete

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m ³ )	INTERVAL	GROUP SYMBOL		LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
20	SP0048	70%	_	0.092			SP	Very fine to fine SAND, light olive-brown (2.5Y 5/4), few thin (1/4" thick) scattered layers with trace fines.	21 —
23		0%			X				BACKFILLED 23
25	SP0049	100%	<b>.</b>	0.023	X				w/ BENTONITE 24— GROUT 25—
27	SP0050	80%		0.000	$\bigvee$				27—
29	SP0051	100%	<b>.</b>	0.110	X		CH C⊓	CLAY, gray (2.5Y 4/1), medium high plasticity, wet.	29 —
31	SP0052	30%		0.000	X		SP	Fine to medium SAND, dark gray (5YR 4/1), predominantly fine-grained, wet.	31-
33	SP0053	100%		0.081	X		CI√	CLAY, gray (10YR 6/1), medium high plasticity, wet.	33-
35		5%			X				35—
37								Total depth @ 36' BGS.	37 — 38 —
39									39— 39— 40—

Drilled By: Summit Drilling

Well Casing Elevation: NA

Borehole Diameter: 2.0"

Datum: NA

Drill Method: Push probe

Ground Surface Elevation: NA

Drill Date: 13 November 2002

Stoulid Surface Elevation. NA

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Project No: 8600B3N.005.0402

Project: Ventron/Velsicol Site

Client: Rohm and Haas

Ground surface: Asphaltic concrete

Borehole: B-14

Geologist: David Lamadrid, R.G.

Location: Wood-Ridge/Carlstadt, NJ

Hg Vapor (mg/m³) OVM **GROUP** SAMPLE LITHOLOGIC WELL CONSTRUCTION DETAIL DEPTH ( NUMBER (ppm) **SYMBOL** DESCRIPTION (not applicable) Asphaltic concrete Subbase SP0054 75% 0.004 Sandy CLAY, dark red-brown (5YR 2.5/2), fine sand 10-20%, some fine gravel, few hard CL concretions, moist. Indicates sample was analyzed. 0% Silt layer 1.5" thick at contact, dark brown (7.5YR 3/2), some organic matter (rootlets), 0.005 ML SP0055 100% **BACKFILLED** moist to wet. w/ BENTONITE Color change to yellow-brown (10YR 5/6) @ 4.9' BGS w/ some olive-brown (2.5Y 5/3) mottling, some iron-oxide flecks.  $\nabla$ **GROUT** 6 Wet @ 6' BGS. SP0056 20% 0.000 8 100% 0.000 SP0057 9 ZZZ CL Silty CLAY, same appearance as above 10 Very fine to fine SAND, yellow-brown (10YR 5/6), wet. 0.000 SP0058 100% 11 11 12 -Occasional thin clay layers (< 1/4" thick), dark gray (5YR 4/1). 0.000 SP0059 100% 13 13 14 0.000 SP0060 30% 15 15 16 Color change to dark gray (2.5Y 4/1). SP0061 100% 0.003 17 17 18 20% 0.000 SP0062 19 19

Drilled By: Summit Drilling

Well Casing Elevation: NA

Datum: NA

Drill Method: Push probe

Ground Surface Elevation: NA

Drill Date: 13 November 2002

Borehole Diameter: 2.0"



Project: Ventron/Velsicol Site

Client: Rohm and Haas

Location: Wood-Ridge/Carlstadt, NJ

Borehole: B-14

Ground surface: Asphaltic concrete

Geologist: David Lamadrid, R.G.

DEPTH (Feet)	SAMPLE NUMBER	% RECOVERY	OVM (ppm)	Hg Vapor (mg/m³)	INTERVAL	GRC SYMI		LITHOLOGIC DESCRIPTION	WELL CONSTRUCTION DETAIL (not applicable)
							i		
20 - - - 21 - -	SP0063	100%	ò	0.191	X		SP	Very fine to fine SAND, dark gray-brown (2.5Y 4/2) w/ occasional thin clay layers (< 1/4" thick), wet.	21 -
23	SP0064	40%	<b>x</b>	0.068	$\bigvee$				22— 23— BACKFILLED
24	SP0065	100%	<u> </u>	0.043					w/ BENTONITE 24— GROUT 25—
26	SP0066	20%	in	0.008	X				26— - 27—
28	SP0067	80%		0.008	X				28-
30		0%			X				30-
32	SP0068	100%	•	0.010	X		CI/	CLAY, gray (10YR 6/1), medium high plasticity, wet.	32 -
34		20%			X				34-
36						////		Total depth @ 36' BGS.	36
37									37-
38									38-
39									39—
40									40-

**Drilled By: Summit Drilling** 

Well Casing Elevation: NA

Datum: NA

Drill Method: Push probe

Ground Surface Elevation: NA

Drill Date: 13 November 2002

Borehole Diameter: 2.0"

# **Appendix C**

# **Quality Assurance Review**



# **Quality Assurance Review**

### Introduction

A quality assurance review was completed by Exponent for total solids and metals analyses on groundwater and soil samples collected during the Phase 1A supplemental field investigation (SFI) at the Ventron/Velsicol site located in Wood-Ridge and Carlstadt, New Jersey. Groundwater samples were collected from September 24–27, 2002 and soil samples were collected from October 8–10, 2002 and November 13, 2002. Overall, the data reported are of good quality. A total of 4 results were qualified as estimated (J) and 17 results were restated as undetected (U). No results were rejected (R). The quality assurance review was conducted to verify that the laboratory quality assurance and quality control procedures were documented and that the quality of the data is sufficient to support the use of the data for their intended purposes. The quality assurance review included evaluating the applicable quality control results reported by the laboratory. The data validation procedures, the analytical methods used to complete the analyses, and the results of the quality assurance review are presented below.

## **Data Validation Procedures**

Data validation procedures included evaluating the sample results and applicable quality control results reported by the laboratory. The data were subjected to an abbreviated data validation review using guidelines specified by the *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (U.S. EPA 1994). For the abbreviated validation, the following laboratory deliverables were reviewed:

- Case narratives discussing analytical problems (if any) and procedures
- Chain-of-custody documentation to verify completeness of data
- Sample preparation logs or laboratory summary result forms to verify analytical holding time constraints were met
- Initial and continuing calibration results to assess instrument performance
- Method blank, continuing calibration blank, and equipment rinsate blank results to determine whether an analyte reported as detected in any sample was the result of possible contamination at the laboratory or contamination during field sampling
- Laboratory control sample (LCS) analyses (i.e., blank spikes) and matrix spike (MS) analyses to assess analytical accuracy

- Laboratory duplicate sample, matrix spike duplicate (MSD), and/or duplicate LCS results, as applicable, to assess analytical precision
- Analytical results for analyses performed.

The abbreviated data validation included review of the summary of quality control results reported by the laboratory. Ten percent of the laboratory data reported was verified (e.g., calculations and transcriptions and review of instrument printouts and bench sheets). The laboratory case narratives did not indicate any significant problems with data that were not reviewed. In addition, results for applicable field duplicate samples were evaluated to provide additional information in support of the quality assurance review.

Data qualifiers were assigned during the quality assurance reviews if applicable control limits were not met, in accordance with functional guidelines (U.S. EPA 1994) and the quality control requirements stated in the methods.

# **Analytical Methods**

Analyses were completed according to the following procedures:

- Unfiltered barium, copper, iron, lead, manganese, nickel, and vanadium in 16 groundwater samples and one equipment rinsate blank by inductively coupled plasma-atomic emission spectrometry using U.S. EPA SW-846 Method 6010B (U.S. EPA 1997). Analyses were performed by Columbia Analytical Services, Inc., Rochester, New York.
- Unfiltered arsenic, cadmium, and thallium in 16 groundwater samples and one equipment rinsate blank by inductively coupled plasma-mass spectrometry using U.S. EPA SW-846 Method 6020 (U.S. EPA 1997).
   Analyses were performed by Severn Trent Services, Inc., Amherst, New York.
- Unfiltered and filtered mercury in 16 groundwater samples and one equipment rinsate blank by cold vapor atomic fluorescence spectrometry using EPA Method 1631C (U.S. EPA 2001). Analyses were performed by Cebam Analytical, Inc., Seattle, Washington.
- Total mercury in 26 soil samples by cold vapor atomic absorption spectrometry using U.S. EPA SW-846 Method 7471A (U.S. EPA 1997) and total mercury on one equipment rinsate blank using U.S. EPA SW-846 Method 7470A (U.S. EPA 1997). In addition, all soil samples were analyzed for total solids using EPA Method 160.0 (U.S. EPA 1983). Analyses were performed by Columbia Analytical Services, Inc., Rochester, New York.

# **Data Quality Assessment**

The laboratory data were evaluated in terms of completeness, holding times, instrument performance, bias, and precision. The results of the quality control procedures used during sample analyses are discussed below.

## Completeness

Results reported by the laboratory were 100-percent complete.

## **Holding Times and Sample Preservation**

All analytical holding time constraints and sample preservation requirements were met for all samples.

#### Calibration

The calibration of the analytical instruments, as documented by the laboratory, was acceptable. No changes in instrument performance that would have resulted in the degradation of data quality were indicated during any analytical sequence.

## **Initial and Continuing Calibration**

Initial and continuing calibrations, as documented by the laboratory, were completed for all applicable target analytes and met the criteria for acceptable performance (Table 1) and frequency of analysis.

# **Initial and Continuing Calibration Blanks**

The initial and continuing calibration blank analyses, as documented by the laboratory, met the criteria for acceptable performance (Table 1).

# **Laboratory Method Blank Analyses**

No target analytes were detected in the laboratory method (e.g., preparation) blanks and met the criteria for acceptable performance (Table 1).

# Accuracy

The accuracy of the analytical results is evaluated in the following sections in terms of analytical bias (MS/MSD and LCS recoveries) and precision (duplicate sample analyses and/or MSD analyses).

#### **Matrix Spike Recoveries**

The recoveries reported by the laboratory for MS/MSD analyses, and the frequency of analysis, met the criteria for acceptable performance (Table 1).

#### **Laboratory Control Sample Recoveries**

The recoveries reported by the laboratory for all LCS recoveries, and the frequency of analysis, met the criteria for acceptable performance (Table 1).

#### **Precision**

Results for all duplicate sample and/or MS/MSD analyses, and the frequency of analysis, met the criteria for acceptable performance (Table 1).

## **Field Quality Control Samples**

Field quality control samples consisted of one set of field duplicate samples and an equipment rinsate blank for each sampling event, with the exception of samples collected on November 13, 2002. The results of the field quality control samples are discussed below.

### Field Duplicate Samples

For the field duplicate sample analyses, the precision of all target analytes reported as detected was generally acceptable. The relative percent difference for mercury in the groundwater field duplicate pair and the soil field duplicate pair was above the 35 percent validation control limit. The following action was taken:

- Results reported for dissolved mercury in the groundwater samples GW0311 and GW0312 were qualified as estimated (assigned a *J* qualifier)
- Results reported for mercury in the soil samples SP0013 and SP0014 were qualified as estimated (assigned a *J* qualifier).

These qualified data may exhibit a greater degree of uncertainty than unqualified data.

### **Equipment Rinsate Blanks**

No target analytes were reported as detected in the equipment rinsate blanks, with two exceptions. Total arsenic and dissolved mercury were reported as detected in the equipment rinsate blanks. The following actions were taken:

- Thirteen groundwater results reported for total arsenic were restated as undetected (a *U* qualifier was assigned to the concentration reported)
- Four groundwater results reported for dissolved mercury were restated as undetected (a *U* qualifier was assigned to the concentration reported).

Table 1. Acceptable performance^a

	EPA SW-846 6010B ^b (ICP-AES)	EPA SW-846 6020 ^b (ICP-MS)	EPA Method 1631C° (CVAFS)	EPA SW-846 7470A/7471A° (CVAA)
Initial Calibration	90–110 %R	90–110 %R	80–120%	80–120%
Continuing Calibration	90-110 %R	90-110 %R	80–120%	80-120%
Initial and Continuing Calibration Blanks	<idl< td=""><td><idl< td=""><td><idl< td=""><td><idl< td=""></idl<></td></idl<></td></idl<></td></idl<>	<idl< td=""><td><idl< td=""><td><idl< td=""></idl<></td></idl<></td></idl<>	<idl< td=""><td><idl< td=""></idl<></td></idl<>	<idl< td=""></idl<>
Laboratory Method Blanks	<idl< td=""><td><idl< td=""><td><idl< td=""><td><idl< td=""></idl<></td></idl<></td></idl<></td></idl<>	<idl< td=""><td><idl< td=""><td><idl< td=""></idl<></td></idl<></td></idl<>	<idl< td=""><td><idl< td=""></idl<></td></idl<>	<idl< td=""></idl<>
Matrix Spike Recoveries	75–125 %R	75–125 %R	75–125 %R	75–125 %R
Laboratory Control Samples	80–120 %R	80–120 %R	80-120 %R	80-120 %R
Precision	±25 RPD	±25 RPD	±25 RPD	±25 RPD

Note: CVAA - cold vapor atomic absorption

CVAFS - cold vapor atomic fluorescence spectrometry
EPA - U.S. Environmental Protection Agency

ICP-AES - inductively coupled plasma-atomic emission spectrometry

ICP/MS - inductively coupled plasma-mass spectrometry

IDL - instrument detection limit

%R - percent recovery

RPD - relative percent difference

### References

U.S. EPA. 1983. Methods for chemical analysis of water and wastes. EPA 600/4-79-020. U.S. Environmental Protection Agency, Environmental Monitoring and Support Laboratory, Cincinnati, OH.

U.S. EPA. 1994. USEPA Contract Laboratory Program national functional guidelines for inorganic data review. EPA 540/R-94/013. February 1994. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, DC.

U.S. EPA. 1997. Test methods for evaluating solid waste. SW-846. Version 2.0. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, DC.

U.S. EPA. 2001. Method 1631, Revision C: mercury in water by oxidation, purge and trap, and cold vapor atomic fluorescence spectrometry. EPA-821-R-01-024. March 2001. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

^a Criteria listed below were used for validation purposes only.

^bU.S. EPA 1997. ^cU.S. EPA 2001.